SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM

Bulletin 100
VOLUME 7

Q11.U6
BULL.100
V.7-8

CONTRIBUTIONS TO THE BIOLOGY OF THE PHILIPPINE ARCHIPELAGO AND ADJACENT REGIONS

1384

THE FISHES OF THE FAMILIES POMACENTRIDAE, LABRIDAE, AND CALLYODONTIDAE, COLLECTED BY THE UNITED STATES BUREAU OF FISHERIES STEAMER "ALBATROSS," CHIEFLY IN PHILIPPINE SEAS AND ADJACENT WATERS

BY

HENRY W. FOWLER
Of the Academy of Natural Sciences of Philadelphia

and

BARTON A. BEAN
Of the United States National Museum

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

ADVERTISEMENT

The scientific publications of the National Museum include two series, known, respectively, as *Proceedings and Bulletin.*

The *Proceedings*, begun in 1878, is intended primarily as a medium for the publication of original papers, based on the collections of the National Museum, that set forth newly acquired facts in biology, anthropology, and geology, with descriptions of new forms and revisions of limited groups. Copies of each paper, in pamphlet form, are distributed as published to libraries and scientific organizations and to specialists and others interested in the different subjects. The dates at which these separate papers are published are recorded in the table of contents of each of the volumes.

The *Bulletins*, the first of which was issued in 1875, consist of a series of separate publications comprising monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, catalogues of type-specimens, special collections, and other material of similar nature. The majority of the volumes are octavo in size, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable. In the *Bulletin* series appear volumes under the heading *Contributions from the United States National Herbarium*, in octavo form, published by the National Museum since 1902, which contain papers relating to the botanical collections of the Museum.

The present work forms No. 100, volume 7 of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., *February 23, 1928.*

PREFACE

The first part of a report on the immense collection of fishes made during the cruise of the United States Bureau of Fisheries steamer *Albatross* in Philippine waters and adjacent seas in 1907–1910 is herewith presented. Reports on other families will follow as soon as completed.

The present collections were obtained by dredging, seining, trapping, dynamiting the reefs, as well as by the use of submarine light at night and by the purchase of market material.

Great credit is due to the scientific staff, consisting of Dr. Hugh M. Smith, director of the expedition; F. M. Chamberlain, naturalist; Lewis Radcliffe, assistant naturalist; C. E. Wells, ship's clerk; and K. Ito, artist; for to their efforts we owe not only the splendid preservation of the material, but ichthyologists are also deeply indebted to them for the large number of color notes which accompany the specimens. These notes were based upon living material or upon specimens as soon after death as possible. In many instances these color notes were supplemented by color sketches made by K. Ito. These color notes are printed in the text and are cited with the tin-tag field number attached to the specimen upon which they were based.

32872—28

TABLE OF CONTENTS

	Page
Introduction	1
Family Pomacentridae	3
Genus Premnas	4
Premnas biaculeatus	4
Genus Amphiprion	6
Amphiprion polymnus	6
Amphiprion polylepis	9
Amphiprion percula	11
Genus Dascyllus	13
Subgenus Pellochromis	14
Dascyllus trimaculatus	14
Dascyllus marginatus	17
Subgenus Dascyllus	20
Dascyllus melanurus	20
Dascyllus aruanus	21
Genus Lepidozygus	25
Lepidozygus tapeinosoma	25
Genus Acanthochromis	27
Acanthochromis polyacanthus	27
Genus Chromis	29
Subgenus Chromis	31
Chromis ternatensis	31
Chromis amboinensis	35
Chromis scotochilopterus	38
Chromis reticulatus	40
Chromis weberi	41
Chromis atripes	43
Chromis dimidiatus	45
Chromis opercularis	47
Chromis lineatus	50
Chromis desmostigma	51
Chromis elerae	52
Chromis retrofasciatus	53
Chromis cinerascens	54
Chromis bitaeniatus	56
Chromis azurelineatus	57
Subgenus Lepidochromis	58
Chromis lepidolepis	58
Subgenus Dorychromis	60
Chromis analis	60
Subgenus Hoplochromis	61
Chromis caeruleus	61
Genus Cheiloprion	64
Cheiloprion labiatus	64

Family Pomacentridae—Continued. Page

Genus Pomacentrus 65
Pomacentrus pavo 68
Pomacentrus caeruleus 70
Pomacentrus violescens 71
Pomacentrus taeniurus 72
Pomacentrus smithi 75
Pomacentrus littoralis 76
Pomacentrus melanopterus 80
Pomacentrus amboinensis 86
Pomacentrus tripunctatus 89
Pomacentrus grammorhynchus 97
Pomacentrus lepidogenys 98
Pomacentrus reidi 99
Pomacentrus stigma 100
Pomacentrus perspicillatus 101
Pomacentrus prosopotaenia 104
Pomacentrus notophthalmus 107
Pomacentrus pristiger 109
Pomacentrus fasciatus 111
Pomacentrus ovoides 112
Pomacentrus breviceps 114
Pomacentrus beauforti 115
Pomacentrus lividus 116
Pomacentrus nigricans 118
Genus Daya 120
Daya jerdoni 120
Genus Abudefduf 121
Abudefduf saxatilis 124
Abudefduf bengalensis 128
Abudefduf sexfasciatus 129
Abudefduf sordidus 132
Abudefduf septemfasciatus 135
Abudefduf notatus 136
Abudefduf curacao 138
Abudefduf aureus 142
Abudefduf unimaculatus 145
Abudefduf dickii 147
Abudefduf leucozonus 149
Abudefduf azurepunctatus 149
Abudefduf lacrymatus 151
Abudefduf bonang 154
Abudefduf xanthurus 155
Abudefduf xanthonotus 159
Abudefduf thoracotaeniatus 158
Abudefduf behnii 160
Abudefduf melas 161
Abudefduf oxyodon 164
Abudefduf bleekeri 165
Abudefduf biocellatus 166
Abudefduf cyaneus 168
Abudefduf glaucus 169
Abudefduf leucogaster 171
Abudefduf uniocellatus 173

Family Pomacentridae—Continued. Page
Genus Abudefduf sapphirus 175
Abudefduf amabilis 177
Abudefduf albofasciatus 178
Abudefduf zonatus 179
Abudefduf azysron 181
Abudefduf bankieri 181
Abudefduf melanocarpus 182
Abudefduf anabatoides 183
Genus Hemiglyphidodon 185
Hemiglyphidodon plagiometopon 185
Family Labridae 188
Pseudolabrus rubiginosus 188
Pseudojulis girardi 188
Thalassoma fuscus 188
Genus Xiphocheilus 190
Xiphocheilus quadrimaculatus 190
Genus Choerodon 191
Subgenus Choerodon 192
Choerodon azurio 192
Choerodon anchorago 193
Choerodon zamboangae 196
Choerodon margaritiferus 197
Choerodon schoenleinii 198
Choerodon melanostigma 199
Subgenus Macrochoerodon 200
Choerodon oligacanthus 200
Genus Lepidaplois 201
Subgenus Lienardella 202
Lepidaplois mesothorax 202
Lepidaplois diana 204
Lepidaplois perditio 206
Lepidaplois bilunulatus 207
Lepidaplois hirsutus 208
Genus Pseudodax 210
Pseudodax moluccanus 210
Genus Wetmorella 211
Wetmorella philippina 211
Genus Epibulus 212
Epibulus insidiator 213
Genus Duymaeria 215
Duymaeria flagellifera 216
Duymaeria guttata 218
Genus Labrichthys 219
Labrichtys cyanotaenia 220
Genus Labroides 221
Labroides dimidiatus 222
Labroides xanthurus 223
Labroides bicolor 224
Genus Anampses 224
Anampses peterophthalmus 225
Anampses geographicus 226
Anampses meleagrides 227
Anampses caeruleo-punctatus 228

Family Labridae—Continued. Page

Genus Anampses diadematus 230
Stethojulis 231
Subgenus Stethojulis 232
Stethojulis strigiventer 232
Stethojulis axillaris 234
Stethojulis phekadopleura 237
Stethojulis kalosoma 238
Stethojulis interrupta 240
Subgenus Rhytejulis 241
Stethojulis albovittata 241
Stethojulis renardi 242
Stethojulis trilineata 243
Genus Hemigymnus 244
Hemigymnus fasciatus 245
Hemigymnus melapterus 247
Genus Halichoeres 250
Halichoeres centriquadrus 253
Halichoeres scapularis 255
Halichoeres trimaculatus 258
Halichoeres leucurus 260
Halichoeres kallochroma 261
Halichoeres melanurus 262
Halichoeres richmondi 263
Halichoeres melanochir 264
Halichoeres marginatus 265
Halichoeres vrolickii 266
Halichoeres notopsis 267
Halichoeres hoevenii 268
Halichoeres miniatus 270
Halichoeres margaritaceus 271
Halichoeres nebulosus 273
Halichoeres reichei 275
Halichoeres desmogenys 276
Halichoeres solorensis 278
Halichoeres papilionaceus 278
Halichoeres nigrescens 280
Halichoeres bicolor 282
Halichoeres leparensis 283
Halichoeres binotopsis 285
Halichoeres hyrtlii 285
Halichoeres poecilopterus 286
Halichoeres amboinensis 288
Halichoeres tenuispinis 288
Halichoeres prosopeion 290
Halichoeres hartzfeldii 291
Halichoeres argus 292
Halichoeres chloropterus 294
Halichoeres gymnocephalus 296
Halichoeres podostigma 297
Halichoeres leucostigma 299
Genus Macropharyngodon 299
Macropharyngodon geoffroy 299

Family Labridae—Continued. Page
Genus Leptojulis ---- 300
Leptojulis pardalis ---- 301
Genus Coris ---- 302
Coris angulata ---- 303
Coris variegata ---- 304
Coris batuensis ---- 306
Coris venusta ---- 307
Coris multicolor ---- 308
Coris philippina ---- 309
Coris flavovittata ---- 310
Coris gaimard ---- 311
Genus Hologymnosus ---- 313
Hologymnosus semidiscus ---- 313
Genus Thalassoma ---- 315
Thalassoma quinquevittatus ---- 316
Thalassoma hardwicke ---- 317
Thalassoma schwanefeldi ---- 320
Thalassoma lunare ---- 321
Thalassoma jansenii ---- 324
Thalassoma umbrostigma ---- 325
Thalassoma lutescens ---- 326
Thalassoma melanochir ---- 328
Thalassoma duperrey ---- 329
Thalassoma amblycephalus ---- 330
Thalassoma ballieui ---- 331
Genus Gomphosus ---- 331
Gomphosus varius ---- 332
Gomphosus tricolor ---- 333
Genus Cheilio ---- 335
Cheilio inermis ---- 335
Genus Cirrhilabrus ---- 338
Cirrhilabrus temminckii ---- 338
Cirrhilabrus cyanopleura ---- 339
Genus Pseudocheilinus ---- 341
Pseudocheilinus hexataenia ---- 341
Genus Cheilinus ---- 343
Cheilinus bimaculatus ---- 344
Cheilinus oxycephalus ---- 346
Cheilinus trilobatus ---- 347
Cheilinus fasciatus ---- 350
Cheilinus undulatus ---- 352
Cheilinus diagrammus ---- 354
Cheilinus unifasciatus ---- 357
Cheilinus rostratus ---- 358
Cheilinus chlorurus ---- 362
Genus Novaculichthys ---- 365
Subgenus Novaculichthys ---- 365
Novaculichthys macrolepidotus ---- 365
Subgenus Semachlorella ---- 367
Novaculichthys bifer ---- 367
Genus Cymolutes ---- 368
Cymolutes lecluse ---- 368

Family Labridae—Continued. Page
Genus Hemipteronotus 370
Hemipteronotus pentadactylus 370
Hemipteronotus celebicus 372
Family Callyodontidae 372
Genus Scarichthys 373
Scarichthys auritus 373
Scarichthys coeruleopunctatus 375
Genus Leptoscarus 376
Leptoscarus moluccensis 377
Leptoscarus viridescens 378
Leptoscarus vaigiensis 380
Genus Callyodon 381
Callyodon oedema 385
Callyodon erythrodon 385
Callyodon margaritus 397
Callyodon sordidus 398
Callyodon quoyi 407
Callyodon forsteri 410
Callyodon mutabilis 414
Callyodon microcheilos 417
Callyodon microrhinos 418
Callyodon harid 420
Callyodon pulchellus 423
Callyodon dimidiatus 425
Callyodon fasciatus 429
Callyodon kelloggi 434
Callyodon frenatus 436
Callyodon janthochir 444
Callyodon caudofasciatus 446
Callyodon dussumieri 449
Callyodon oviceps 452
Callyodon pectoralis 453
Callyodon lineolabiatus 457
Callyodon balinensis 457
Callyodon viridibusius 459
Callyodon tricolor 460
Callyodon blochii 462
Callyodon rubroviolaceus 469
Callyodon vermiculatus 472
Callyodon dubius 473
Callyodon hypselopterus 484
Callyodon nuchipunctatus 487
Callyodon guttatus 493
Callyodon muricatus 495
Callyodon bicolor 496
Examination of plates 499
Index 503

THE FISHES OF THE FAMILIES POMACENTRIDAE, LABRIDAE, AND CALLYODONTIDAE COLLECTED BY THE UNITED STATES BUREAU OF FISHERIES STEAMER "ALBATROSS," CHIEFLY IN PHILIPPINE SEAS AND ADJACENT WATERS

By Henry W. Fowler
Of the Academy of Natural Sciences of Philadelphia,

and

Barton A. Bean
Of the United States National Museum

INTRODUCTION

In this paper we set forth the old group of Acanthopterygii Pharyngognathi of Günther, as represented by the *Albatross* collections. Only the Pomacentridae, Labridae, and Callyodontidae are included, as they are the only families represented. Though the localities are in great measure in the Philippines, a number also pertain to the Dutch East Indies and a few to Formosa, China, and the Midway group of the Hawaiian region of Oceania.

These collections contain the most extensive Philippine materials yet obtained, and it therefore seems advisable to present our work in somewhat detailed form. The various distinctions for both genera and species, besides descriptions of all the species, have been attempted. Upward of 250 species are included, and we are therefore able to establish nearly all the known Philippine species. A few are, also, additions to the fauna of the archipelago as well as to the entire East Indian region.

In Pomacentridae we describe the following new forms:

Pellochromis, new subgenus
Chromis reticulatus, new species.
Chromis weberi, new species
Chromis lineatus, new species
Chromis elerae, new species.
Chromis bitaeniatus, new species
Lepidochromis, new subgenus
Dorychromis, new subgenus
Pomacentrus smithi, new species
Pomacentrus reidi, new species
Pomacentrus beauforti, new species.
Abudefduf azurepunctatus, new name
Abudefduf thoracotaeniatus, new species.
Abudefduf melanocarpus, new species.
Dascyllus.
Chromis atripes, new species.
Chromis desmostigma, new species.
Chromis azurelineatus, new species.
Chromis.
Chromis.
Pomacentrus lepidogenys, new species.
Pomacentrus stigma, new species.
Abudefduf bleekeri, new species name.

In Labridae:

Choerodon margaritiferus, new species.
Choerodon melanostigma, new species.
Macrochoerodon, new subgenus_____ *Choerodon.*
Lienardella, new subgenus_____ *Lepidaplois.*
Gymnopropoma, new subgenus_____ *Lepidaplois.*
Wetmorella philippina, new genus and species_____ *Duymaeria guttata*, new species.
Labroides bicolor, new species.
Rhytejulis, new subgenus_____ *Stethojulis.*
Halichoeres richmondi, new species____ *Halichoeres melanochir*, new species.
Halichoeres desmogenys, new species.. *Halichoeres leucostigma*, new species.
Coris philippina, new species.
Semachlorella, new subgenus_____ *Novaculichthys.*

In Callyodontidae:

Callyodon lineolabiatus, new species.
Callyodon viridibusius, new species.
Callyodon vermiculatus, new species.

We also include an examination of all the installed representatives in the general series of fishes in the United States National Museum pertaining to the species embraced by this report, along with the types, and the material in the Academy of Natural Sciences has been studied and listed in the same manner.

From these studies many valuable deductions and corrected determinations of materials have resulted.

The figures illustrating this report were prepared under our direction with the assistance of George MacReynolds.

In explanation of the method used in describing species we might say that the depth of the body refers to its greatest depth not including vertical fins and the number of times it may be computed in the body length to the base of the caudal fin. The head is measured likewise with its breadth referring to its length; also the snout, eye, maxillary, and interorbital. When the mandible or lower jaw protrudes in front, the snout is mentioned with the number of times it is contained in the head, followed by the statement from snout tip, thus showing that the protruding portion of the lower jaw is not included in this measurement. In the same way the dimensions are intended to follow through the descriptions or until it is indicated as the total head length.

As the lateral line is frequently incomplete or interrupted, the sections are always indicated, thus a plus sign indicates an interruption (of either scales or pores), or of those on the caudal base. In cases where the lateral line is angularly bent on the side of the tail the interruption of the count is indicated by a comma.

We are indebted to Earl D. Reid, of the Division of Fishes, for assistance in handling the large series of specimens.

Family POMACENTRIDAE

Body short, deeply ovoid, and well compressed. Snout short, often obtuse. Eye moderate, or large. Mouth small, terminal. Teeth only in jaws, conic or compressed incisors, palate edentulous. Preorbital sheaths maxillary. Single nostril each side of snout. Hind preopercle edge free, entire or serrated. Gill membranes free from the isthmus. Gills 3½. Pseudobranchiae present. Branchiostegals 5 to 7. Lower pharyngeals entirely joined as a single bone. Subocular shelf and entopterygoid present. Fourth to fifth vertebrae with transverse processes; ribs, when present, attached to transverse processes of vertebrae. Scales usually minutely ctenoid, variable. Soft dorsal, anal and caudal scaled basally. Ventral axil with scaly flap. Lateral line divided, as upper anterior arch of tubes and lower posterior median section of simple pores, of which few or none on caudal base. Dorsal fin long, single, with many strong spines, and spinous fin longer than soft fin. Soft dorsal and anal similar. Anal spines 2. Paired fins usually long, ventral with spine and 5 rays, of which front ray longest and usually filamentous.

Small, shapely fishes, compact in form, and most very brilliant or strikingly colored. They abound in the reefs of tropical seas, especially about coral heads, frequently in tide or rock pools. Many are extremely active and wary, so that only occasional specimens are obtained in small hauling seines. The extensive series obtained in the Philippines were most all secured by means of dynamite. They are frequent with many and greatly diverse invertebrate associations. Many feed on small marine animals, though those with incisor teeth are adapted to a herbivorous life.

ANALYSIS OF THE GENERA

*a*¹. Teeth conic or villiform, not compressed.
  *b*¹. PREMNINAE. Preorbital with strong spine extended backward. **Premnas.**
  *b*². CHROMINAE, Preorbital without strong spine.
    *c*¹. Some of opercles with serrae **Amphiprion.**
      *d*¹. All of opercles serrate.
      *d*². Preopercle alone, sometimes preorbital, serrated.
        *e*¹. Dorsal spines 12 or 13.
          *f*¹. Less than 30 scales in median lateral series **Dascyllus.**
          *f*². More than 30 scales in median lateral series **Lepidozygus.**
        *e*². Dorsal spines 17 **Acanthochromis.**
    *c*². None of opercles serrated; lateral line not developed on tail **Chromis.**
*a*². POMACENTRINAE. Teeth more or less compressed.
      *g*¹. Lips greatly thickened, fimbriate and curled back over snout **Cheiloprion.**
      *g*². Lips normal.

h^1. Preopercle serrate.
i^1. Spinous dorsal and anal scaled like soft fins; subopercle and interopercle entire ..... **Pomacentrus.**
i^2. Spinous dorsal and anal naked; subopercle and interopercle serrated ..... **Daya.**
h^2. Preopercle smooth.
f^1. Gill rakers less than 40 ..... **Abudefduf.**
f^2. Gill rakers 70 to 80 ..... **Hemiglyphidodon.**

Genus PREMNAS Cuvier

Premnas Cuvier, Règne Animal, vol. 2, 1817, p. 345. Type *Chaetodon biaculeatus* Bloch, monotypic.

Oval. Head deep. Opercle rugosely striate, preopercle and subopercle denticulate. Preorbital ends in long, strong spine, directed backward. Branchiostegals, 5 or 6. Scales, 70 in median lateral series. Axillary ventral scale not developed. Dorsal with 10 spines, rarely 9; rays, 16 to 19. Anal with 2 spines and 14 to 16 rays. Caudal and paired fins rounded.

Indian Ocean and East Indian region.

PREMNAS BIACULEATUS (Bloch)

Chaetodon biaculeatus Bloch, Naturg. Ausl. Fisch., vol. 4. 1790, p. 11, pl. 219, fig. 2. East Indies.

Holacanthus biaculeatus Lacépède, Hist Nat. Poiss., vol. 4, 1803, p. 535 (East Indies).

Premnas biaculeatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 10 (Philippines).—De Crespigny, Proc. Zool. Soc. London, 1869, p. 248 (commensal with *Actinia crasiecornis*).—Day, Fishes of India, pt. 3, 1877, p. 380, pl. 8*a*, fig. 5 (Malay Archipelago).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 402 (3), figs. 7 and 9; Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 17 (Sumatra, Batu, Nias, Duizend Islands, Java, Bawean, Borneo, Celebes, Solor, Timor, Halmaheira, Batjan, Amboina, Ceram, Goram, Banda, Waigiu, Philippines, New Guinea).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 33 (Mysore).—Day, Fauna British India, vol. 2, 1889, p. 378, fig. 126.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 543 (Luzon, Cavite, Santa Cruz).—(Regan) Bedot, Rev. Suisse Zool., vol. 17, 1909, p. 169 (Amboina).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 7 (Kei Islands).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 334 (Damar, Saleyer, Tual).

Lutjanos trifasciatus Schneider, Syst. Ichth. Bloch, 1801, p. 568 (on Koelreuter, Nov. Comm. Acad. Petropol., vol. 10, 1763, p. 346, pl. 8, fig. 5. Moluccas).

Premnas trifasciatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 405 (Banda).—Valenciennes, Règne An. Cuv. Ill., 1839, pl. 32, fig. 2.—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 19, pl. 6, fig. 6 (Batavia).

Scorpaena aculeata Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 258, 268. No locality.

Holocentrus sonnerat Lacépède, Hist. Nat. Poiss., vol. 4, 1803, pp. 344, 391. Mauritius.

Premnas leucodesmus (KUHL and VAN HASSELT) CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 409. Java.

Premnas semicinctus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 409, pl. 133. No locality.

Premnas unicolor CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 410 (on *Scorpaena aculeata* LACÉPÈDE).

Sargus ensifer GRAY, Cat. Fish. Gronow, vol. 2, 1854, p. 66. Indian Sea.

Premnas epigrammata FOWLER, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 532, pl. 19, lower figure to right. Padang, Sumatra.

Depth 1⅞ to 2; head 3 to 3½, width 1⅖ to 1¾. Snout 3 to 4; eye 4½ to 5, 1⅖ to 1⅘ in snout, 1⅓ to 1⅘ in interorbital; maxillary reaches nearly to front pupil edge, 3 in head; teeth strong, conic, close set, uniserial, short; interorbital 3⅖ to 3½, broad, slightly convex; second preopercular spine along lower edge 1⅘ to 2⅕ in head; preopercle edge more serrate with age. Gill rakers 7+13. lanceolate, slender, rather short.

Tubes in lateral line 44 or 45, pores in straight section 11 to 13+0 to 5; 5 or 6 scales above lateral line to soft dorsal origin, 27 to 29 below, 17 to 22 predorsal; 6 rows of cheek scales. Scales with 4 to 6 basal radiating striae; apical denticles 57 and 9 transverse series of basal elements; denticles absent in small examples.

D. X, 17, 1 or 18, 1, third spine 2 to 2⅛ in head, twelfth ray 1⅓ to 1⅖, first ray often simple; A. II, 14, 1, second spine 2⅓ to 2⅔, tenth ray 1⅖ to 1⅔; caudal 1 to 1⅛, convex behind; least depth of caudal peduncle 1⅘ to 1⅞; pectoral 1 to 1⅛; ventral 1⅛.

Deep brown generally, variously darker with shades of chestnut, sepia, and umber, usually with under surface of head, breast and belly paler. Whitish band, broad at first, includes occiput and extends down across front of opercle at least behind preopercle to gill-opening below, but not on breast. Second whitish band from last dorsal spines, narrowed below to vent. Third whitish band on caudal peduncle narrowed below and variously incomplete below. Iris brownish. Fins all uniform like body, often dusky to blackish terminally.

Mauritius to India, East Indies, Philippines.

20475. Catbalogan, Samar. April 16, 1908. Length, 114 mm.
1 example, Gomomo Island. December 3, 1909. Length, 110 mm.
5517 B. F. Malabon market. August 8, 1908. Length, 143 mm.
21342. Pendek Island. December 15, 1909. Length, 95 mm.
11712. Santa Cruz, Marinduque Island. April 24, 1908. Length, 110 mm.
1 example, Simaluc, Bisibisi. September 23, 1909. Length, 100 mm.
1 example, Talisse Island. November 9, 1909. Length, 63 mm. [2034.] Crimson, bars olive, margined with black.
1 example, Tapiantana Island. September 13, 1909. Length, 115 mm.
1 example, Limbe Strait, Celebes. November 10, 1909. Length, 95 mm.
1 example, Una Una Road, Binang Unang, Gulf of Tomini, Celebes. November 18, 1909. Length, 130 mm. [2050.]

1 example, Togian Bay, Togian Island, Gulf of Tomini, Celebes. November 19, 1909.

27665 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Type of *Premnas epigrammata.*

27667 A.S.N.P. Padang. Messrs. Harrison and Hiller. Paratype of *Premnas epigrammata.*

Genus AMPHIPRION Schneider

Amphiprion Schneider, Syst. Ichth. Bloch, 1801, p. 200. Type *Lutjanus ephippium* Bloch, designated by Jordan and Evermann, Genera of Fishes, vol. 1, 1917, p. 59.

Prochilus (on Klein, 1775) Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 20. Type *Lutjanus ephippium* Bloch.

Actinicola Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, June 10, 1904, p. 533. Type *Lutjanus percula* Lacépède, orthotypic.

Oval or oblong. Upper jaw not protractile. Teeth small, uniserial, conic, or somewhat compressed. Suborbitals, opercle, interopercle, and subopercle with radiating serrae or spines. Scales small, 50 to 65 in median lateral series. Dorsal spines 9 to 11; rays 13 to 21. Anal rays 11 to 15. Caudal rounded or emarginate. Paired fins rounded.

Brilliant fishes living in the coral reefs of the Indo-Pacific. Color pattern strongly contrasted with one or more white cross-bands. Some commensal in large sea anemones.

Several species have been credited to the Philippines, apparently, on questionable authority. They are:

Amphiprion bifasciatus (Bloch). Reported by Elera from Cebu.[1]

Amphiprion intermedius Schlegel and Müller. Reported by Gorgoza from Manila.[2] Also listed by Elera from Cebu, Luzon, and Manila.[3]

Amphiprion sebae Bleeker. Reported from Santa Cruz, Luzon, and Cavite by Elera.[4]

ANALYSIS OF THE SPECIES

a^1. Amphiprion. Dorsal spines lower or subequal with dorsal rays.

b^1. Caudal emarginate or lunate; 3 white transverse bands____ polymnus.

b^2. Caudal truncate; 1 white band, narrow and only present on head. polylepis.

a^2. Anctinicola. Antero-median dorsal spines longest, equal or longer than dorsal rays; caudal rounded; 3 white transverse bands_____ percula.

AMPHIPRION POLYMNUS (Linnaeus)

Perca polymna Linnaeus, Syst. Nat., ed. 10, 1758, p. 291. India.

Anthias polymnus Bloch, Naturg. Ausl. Fisch., vol. 6, 1792, p. 103, pl. 316, fig. 1 (not variety, p. 106, pl. 316, fig. 3) (East Indies).

---

[1] Cat. Fauna Filip., vol. 1, 1895, p. 541.
[2] An. Soc. Espanola, vol. 14, 1885, p. 73.
[3] Cat. Fauna Filip., vol. 1, 1895, p. 542.
[4] Idem, p. 542.

Amphiprion polymnus SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 203 (East Indies, Moluccas, Coromandel).—WEBER, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (Ambon).—SMITH and POPE, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 479 (Urado).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 336 (Banda).—WHITLEY, Australian Zoologist, vol. 4, pt. 4, April, 1926, p. 230 (Northwest Islet).

Prochilus polymnus BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 400 (1), figs. 7–8; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 27 (Sumatra, Nias, Singapore, Banka, Duizend Islands, Java, Celebes, Flores, Solor, Ternate, Buru, Amboina, Ceram, Haruko, Banda, Goram, New Guinea, Philippines).

Sparus milii BORY ST. VINCENT, Dict. Class. Hist. Nat., vol. 16, 1831, p. 130, pl. [113] fig. 2. Shark Bay, West Australia.

Amphiprion mylii THIOLLIÈRE, Faun. Woodlark, 1857, p. 198 (Woodlark Island).

Amphiprion bicinctus RÜPPELL, Atlas Reis Nörd. Afr., Fisch., 1828, p. 139, pl. 35, fig. 1. Red Sea.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 8 (Red Sea); Fishes of Zanzibar, pt. 2, 1867, p. 80 (Zanzibar).

Amphiprion chrysopterus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 401. No locality.

Amphiprion xanthurus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 402. Mauritius.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 5 (East Indies).—JOUAN, Mém. Soc. Nat. Cherbourg, ser. 2, vol. 3, 1868, p. 257 (Hong Kong).—SAUVAGE, Hist. Nat. Madagascar, Poiss., 1891, p. 420 (type).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 31 (Japan).

Anthias clarkii BENNETT, Fishes of Ceylon, 1834, pl. 29. Ceylon.

Amphiprion clarckii VALENCIENNES, Hist. Nat. Poiss., vol. 9, 1833, p. 504 (on BENNETT).

Amphiprion clarkii GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 5 (Amboyna, Singapore, Mozambique, China).—KNER, Reise Novara, Fisch., pt. 2, 1865, p. 240 (Java, Hong Kong).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 396.—DAY, Fishes of India, pt. 3, 1877, p. 378.—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 57 (Endeavour River, Cooktown).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 542 (Navotas, Luzon, Manila).

Prochilus clarkii BLEEKER, Nederl. Tijds. Dierk., vol. 1, 1863, p. 231 (Ternate).

Amphiprion japonicus SCHLEGEL, Faun. Jap., Poiss., pts. 2–4, 1843, p. 66. Japan.

Amphiprion clarkii var. *japonicus* MARTENS, Preuss Exp. Ost Asien, 1876, p. 396 (Nagasaki Bay).

Amphiprion chrysargyrus RICHARDSON, Rep. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1845 (1846), p. 254. China.

Amphiprion clarkii var. *chrysargurus* MARTENS, Preuss. Exp. Ost. Asien 1876, p. 396 (Amboina).

Amphiprion boholensis CARTIER, Verh. Ges. Würzburg, vol. 5, 1873, p. 96. Bohol.—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 543 (Bohol, Cebu).

Amphiprion ephippium (part) DAY, Fauna Brit. India, pt. 2, 1889, p. 376.

Amphiprion snyderi ISHIKAWA, Proc. Depart. Nat. Hist. Tokyo Mus., vol. 1, 1904, p. 11, pl. 5. Bonin Islands.

Depth 1⅘ to 2; head 3⅕ to 3¼, width 1⅖ to 1¾. Snout 3 to 3½; eye 2⅗ to 3¾, 1⅙ in snout, 1¼ in interorbital, greater than

snout or interorbital in young; maxillary to eye, little beyond front eye edge in young, 2½ to 2⅞ in head; teeth compressed, uniserial, ends rounded, anterior larger and more robust; interorbital 2⅛ to 3⅕, broad, but slightly convex; infraorbital and hind preopercle edge serrated. Gill rakers 7+12, lanceolate, slender, moderate.

Tubes in lateral line 31 to 37, pores in straight section 8 to 14+3 or 4; 5 scales above lateral line to soft dorsal origin, 19 or 20 below, 10 to 21 predorsal; 6 rows of cheek scales. Scales with 4 to 6 basal radiating striae; apical denticles 52 to 67, with 8 to 12 transverse series of basal elements; circuli fine.

D. X, 15, 1 or 16, 1, third spine 2⅕ to 2⅖ in head, tenth ray 1⅘ to 1⅞, first ray frequently simple; A. II, 13, 1 or 14, 1, second spine 3½ to 3⅗, fourth ray 2⅕ to 2¼; caudal 2⅗ to 3 in combined head and body, emarginate or lunate; pectoral 3 to 3⅖; ventral 3 to 3⅛; least depth of caudal peduncle 2 in head.

Head light brown, body variously light brown to dusky brown in some examples, usually breast and belly pale. Broad, white, predorsal vertical band down touching hind eye edge and extending to gill opening below, but not on breast. Second broad white band from last dorsal spines and front dorsal rays to postventral or close before front of anal, where meeting its fellow. Caudal peduncle with broad white band comprising most its extent. Iris pale brown. Dorsals dusky brown, except for second white band at bases of last spines and first ray. Anals dusky brown. Other fins all yellowish.

Red Sea, East Africa, East Indies, China, Japan, Queensland, Melanesia.

1 example, Cebu market, Cebu. April 5, 1908. Length, 116 mm. [5375.] Entire body black, except anterior part of head and pectoral region, which vermilion with dusky shade on snout and along blue bar following. Broad azure-blue bar from front of dorsal to lower side of opercle, where terminating in point; bar narrowly margined with brighter blue; dorsal, caudal and anal vermilion, the outer part of dorsal and caudal with orange; first anal membrane and 2 rays black; ventral black at base, orange-vermilion distally; pectoral orange-vermilion.

19975. Cebu market. September 3, 1909. Length, 48 mm. [1888.]

1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 96 mm.

14002. Gondra Island. September 20, 1909. Length, 113 mm.

1 example, Kowlon market. October 22, 1908. Length, 95 mm.

1 example, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 98 mm.

6658 and 6659. Little Santa Cruz Island. May 28, 1908. Length, 65 to 93 mm. 3 examples.

2 examples, Mactan Island, Cebu. March 25, 1909. Length, 94 to 105 mm.

2 examples Pandanon Island. March 23, 1909. Length, 85 to 100 mm.

1 example, Philippines. Length, 80 mm.

1 example, Port Jamelo, Luzon. July 13, 1908. Length, 88 mm.

12189 and 20781. Powati Harbor, Makyan Island. November 28, 1909. Length, 98 to 112 mm. 6 examples.

13401 Rapu Rapu Island. June 22, 1909. Length, 77 mm.
1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 85 mm.
1 example, San Roque, Leyte Island. July 29, 1909. Length, 105 mm. [1756.] General color very dark brown, almost black; snout and front of head paler, bars bluish white; caudal lemon; soft dorsal and anal with very narrow white margin.
1 example, Simaluc Island. September 22, 1909. Length, 100 mm.
2 examples, Sitanki Reef. September 24, 1909. Length, 92 to 105 mm.
13146. Tumindao Island. February 26, 1908. Length, 68 mm.
12778. Limbe Strait, Celebes, East Indies. November 10, 1909. Length, 115 mm.
2 examples, Tidore Island, south of Ternate. November 24, 1909. Length, 83 to 107 mm.
5 examples, Tidore Island. November 25, 1909. Length, 98 to 112 mm.
1 example, Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. Length, 103 mm.
45067 U.S.N.M. Seychelles. From British museum. Length, 65 mm.
50434 U.S.N.M. Hong Kong. P. L. Jouy. Length, 95 mm.
57722 U.S.N.M. Japan. P. L. Jouy. Two examples, 105 to 108 mm.
59692 U.S.N.M. Urado, Japan. Dr. H. M. Smith. Length, 110 mm.
61679 U.S.N.M. Suva, Fiji. Dr. B. G. Corney. Length, 123 mm.
61690 U.S.N.M. Mauritius. Col. N. Pike. Length, 110 mm. Differs in the caudal fin deep brown with narrow white border above extending to tip of fin.
6295 U.S.N.M. Ousima, Japan. W. Stimpson. Length, 97 mm.

AMPHIPRION POLYLEPIS (Bleeker)

Prochilus polylepis Bleeker, Versl. Kon. Akad. Wet. Amsterdam, ser. 2, vol. 11, 1877, p. 135. Amboina and South-east New Guinea.—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 401 (2), fig. 6; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 22 (Amboina and New Guinea).

Amphiprion frenatus Brevoort, Exp. China Jap. Perry, vol. 2, 1856, p. 263, pl. 6, fig. 4. Nafa, Okinawa, Riu Kiu.—Gill, Proc. Acad. Nat. Sci. Phila., 1859, p. 148 (Japan).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 597 (Okinawa and Shimoda).—Snyder, U. S. Nat. Mus., vol. 42, 1912, p. 504 (Okinawa).

Amphiprion tricolor (not Günther) Ishikawa and Matsuura, Prelim. Cat. Fish. Imp. Mus. Tokyo, 1897, p. 31 (Japan).

Depth 1¾ to 1⅞; head 3 to 3⅖, width 1⅓ to 1¾. Snout 2⅞ to 3¼; eye 3⅞ to 4½, 1⅗ in snout, 1⅛ to 1⅖ in interorbital; maxillary reaches eye in young, not quite to eye in adult, 3 to 3⅛ in head; teeth uniserial, strong, rather conic, anterior little enlarged; interorbital 2⅞ to 3, broad, little convex; infraorbital and preopercle edge finely serrated. Gill rakers 5+11, lanceolate, robust, rather short.

Tubes in lateral line 36 to 39, pores in straight section 10 or 11+1 to 3; 5 scales above lateral line to origin of soft dorsal, 19 to 21 below, 19 to 22 predorsal; 4 rows of cheek scales. Scales with 5 to 7 basal radiating striae; apical denticles 50 to 53, with 4 to 8 transverse series of basal elements; circuli fine.

D. IX, 17, 1 or 18, 1, third spine 2⅖ to 2⅞ in head, eighth ray 1⅗ to 1¾, sometimes first 9 rays simple; A. II, 14, 1 or 15, 1, second spine 2⅘ to 3⅕, eighth ray 1½ to 1¾; caudal 1 to 1⅛, convex behind; least depth of caudal peduncle 1⅘ to 1⅞; pectoral 1 to 1⅛; ventral 1 to 1⅕.

Light yellowish to dusky or dusky black generally. Iris brown, variously dark as in darker examples. Broad white band from predorsal down close behind, or touching eye, to lower edge of gill-opening, but not on breast and bordered in pale examples with dusky line in front and behind. Fins yellowish to dusky black or variously all yellowish, even in blackish examples. Sometimes one or both ventrals may be black with broad or narrow yellow tips in dark example. Some examples only with yellow pectorals.

East Indies, Riu Kiu.

Our materials show variations corresponding very well with *Prochilus macrostoma*, *Prochilus polylepis*, and *Prochilus melanopus* of Bleeker's Atlas. Besides these we have other quite variable conditions of color. We have omitted *Amphiprion tricolor* Günther, described with black edges to the anal and ventral from Queensland, as distinct.

2 examples, Batan Island. June 5, 1909. Length, 71 to 108 mm.

1 example, Biri Channel, Balicuatro Island. June 1, 1909. [1547.] Length, 82 mm. Bright reddish-orange; bluish-white bar from nape across side of head to edge of interopercle, narrowly bordered on either side by black line, not quite touching eye; fins body-color, more yellowish terminally; ventral fronts narrowly black and front of anal similar.

189. Busin Harbor, Burias Island. December 29, 1908. Length, 120 mm.

1 example, Butauanan Island. June 13, 1909. Length, 92 mm.

1 example, Cagayan. January 8, 1909. Length, 102 mm.

1 example, Cataingan Bay, Dumurury Point, Masbate. Length, 75 mm. April 19 1908. [553.] Upper part of side and back anteriorly dark chinese-orange, posteriorly sepia-black; posterior portion of caudal peduncle white, washed with very pale chrome, which continues more marked on caudal fin; top of head behind eye dark chinese-orange; anterior portion of snout very pale, with slight orange shade; breast and belly with dusky-orange shading into browns of upper portion of side; white bar across nape downward to interopercle, becoming bluish toward edges and defined from adjoining portion by wavy seal-brown line; similar bar across side including half of dorsal fin from posterior dorsal spine to vent; dorsal body-color, spinous portion margined with darker, posterior or soft portion margined with white; anal color of adjacent body, margined narrowly with white on black; paired fins orange; ventral narrowly with front and margin black.

4 examples, Catbalogan, Samar. April 14, 1908. Length, 98 to 120 mm.

6679 to 6693. Catbalogan, Samar. April 15, 1908. Length, 74 to 130 mm. [531.] Middle of body seal-brown; nose, breast, throat, and contour around to front of dorsal brilliant-orange; broad bar across head and nape to lower edge of interopercle heliotrope-purple, bordered with bluish and again with black; portion on interopercle largely blue; top of head largely suffused with orange; vertical fins bright orange, spinous dorsal narrowly tipped with

black and anal same. Narrow line of black on edges of caudal lobes basally. Paired fins orange, front of anal black. Small examples sometimes entirely orange.

10837. Dalaganem Island. April 8, 1909. Length, 103 mm.

1 example, Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 87 mm.

16142. Mahinog, Camiguin Island. August 3, 1909. Length, 62 mm.

10815. Murcielagos Bay, Mindanao. August 20, 1909. Length, 120 mm.

11275. Pandanon Island. March 23, 1909. Length, 122 mm.

1 example, Point Jamelo, Luzon. July 13, 1908. Length, 78 mm.

20928. Puerta Princesa, Palawan. April 5, 1909. Length, 91 mm.

11398. Sabtan Island. November 8, 1908. Length, 107 mm.

19105. Silino Island. August 10, 1909. Legnth, 113 mm.

2 examples, Sitanki Reef. September 24, 1909. Length, 104 to 117 mm.

1 example, Taganak Island. January 7, 1909. Length, 118 mm. [1045.] Seal brown or black; front of head and fins vermilion; ventrals becoming black at bases; bar through head bluish white, margined with bright blue and black.

2 examples, Tifu Bay, Bouro Island, East Indies. December 10, 1909. Length, 50 to 85 mm.

3 examples, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 74 to 85 mm.

57590 U.S.N.M. Japan. P. L. Jouy. Length, 65 mm.

71702 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 90 mm.

AMPHIPRION PERCULA (Lacépède)

Lutjanus percula Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 194, 239. Port Praslin, New Britain.

Amphiprion percula Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 397 (Port Praslin, Dorah, Borabora, Vanicolo).—Schlegel and Müller, Nat. Ges. Nederl. Zool., 1839–44, p. 19 (Indian Ocean, West Sumatra, Java Sea, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 6 (China Sea, Sumatra, Amboina).—Kner, Reise Novara, Fisch., pt. 2, 1865, p. 241 (Nicobars).—Martens, Preuss. Exp. Ost Asien, 1876, p. 396 (Ternate).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 342 (Darnley Island).—Day, Fishes of India, pt. 3, 1877, p. 379, pl. 80, fig. 4 (Andamans).—Klunzinger, Sitz. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 396 (Port Darwin).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 225, pl. 124 A (East Indies and Solomons).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 33 (Manado and Mysore).—Day, Fauna British India, vol. 2, 1889, p. 377.—Kent, Great Barrier Reef, 1893, p. 145 (Queensland).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 542 (Santa Cruz, Luzon, Cavite).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (Ambon).—Steindachner, Abhand. Senckenberg. Nat. Ges., vol. 25, 1900, p. 438 (Ternate).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 533 (Padang).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), p. 7 (Kei Islands).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 335 (Sanguisiapo, Sulu Archipelago, Borneo Bank, West New Guinea, Gisser, Ambon, Elat, Rotti, Sumbawa, Macassar).

Prochilus percula Bleeker, Nederl. Tijds. Dierk., vol. 1, 1863, p. 241 (Obi); Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 400 (1), fig. 2; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 33 (Sumatra, Batu, Nias, Singapore, Banka, Lepar, Java, Celebes, Timor, Batjan, Buru, Obi

major, Amboina, Haruko, Nussalaut, Ceram, Goram, Waigiu, New Guinea).

Anthias polymnus (part) Bloch, Naturg. Ausl. Fisch., vol. 6, 1792, p. 103, pl. 396, fig. 3 (East Indies).

Amphiprion tunicatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 399, pl. 132. Vanicolo.—Lesson, Voy. Coquille, Poiss., vol. 2 (1), 1830, p. 192, pl. 25, fig. 3 (Praslin and Doreh).

Amphiprion ocellaris Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 399. Sumatra.

Amphiprion melanurus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 400. Sumatra.

Amphiprion bicolor Castelnau, Proc. Zool. Acclim. Soc. Victoria, vol. 2, 1873, p. 92. Port Darwin.

Depth 2⅕ to 2⅓; head 3, width 1½ to 1⅗. Snout 3⅛ to 4; eye 3⅛ to 4⅛, 1⅓ in snout, 1¼ in interorbital, little greater than snout or interorbital in young; maxillary to eye, little beyond front eye edge in young, 2⅔ to 2¾ in head; teeth compressed, rather broad, uniserial, ends convex; interorbital 4 to 4⅛, nearly level; infraorbital edge coarsely denticulate and preopercle with hind edge nearly entire, minutely serrate in young. Gill rakers 5+12, lanceolate, rather robust, short.

Tubes in lateral line 31 to 33, pores in straight section 8 to 10+0; 4 or 5 scales above lateral line to origin of soft dorsal, 23 or 24 below, 12 to 14 predorsal; 5 rows of cheek scales. Scales with 6 to 9 basal radiating striæ; apical denticles 14 to 27, with 2 transverse series of basal elements.

D. X or XI, 14 i to 17, i, third spine 2⅓ to 2⅗ in head, tenth ray 1⅔ to 1⅞; A. II, 12, i, second spine 3, fifth ray 1⅔ to 1⅘; caudal convex behind, 3⅕ in combined head and body; least depth of caudal peduncle 1⅘ to 1⅞ in head; pectoral 1; ventral 1⅓ to 1⅖.

Uniform light brown, usually somewhat cinnamon. Brown white band from occiput down enclosing entire opercular region and not on preopercle edges, darker within each of brown areas. From low posterior dorsal spines second broad white band, triangularly forward to humeral region, and meeting its fellow at vent and postventral region. Caudal peduncle with third broad white band, contrasted with dusky all around edges. Dorsals dark brown, spinous fin, except for white band posteriorly, uniform. Soft dorsal with upper edge usually white, to join white band of spinous dorsal, though not always, and posteriorly margin of fin broadly white. Lower and hind anal edge white with submarginal black band, fin basally orange to light brown. Caudal brown, with hind margin broadly white, with entire border sometimes narrowly white to join white band on caudal peduncle, especially in young examples; also dark to blackish submarginal band. Iris light brownish to yellowish. Pectoral pale brown, with submarginal blackish band

and edge rather broadly white. Ventral yellowish or light brown basally, terminally blackish.

India, East Indies, Queensland, Melanesia, Micronesia, and Polynesia.

2 examples, Bolinas Bay. May 10, 1910. Length, 45 to 72 mm.
1 example, Catbalogan, Samar. April 14, 1908. Length, 82 mm.
3 examples, Catbalogan, Samar. April 16, 1908. Length, 48 to 70 mm.
14445. Catbalogan, Samar. April 16, 1908. Length, 83 mm.
1 example, Cebu market. August 28, 1909. Length, 51 mm.
2 examples, Endeavor Strait. December 23, 1908. Length, 41 to 69 mm.
1 example, Gomomo Island. December 3, 1909. Length, 57 mm.
22605. Mompog Island. March 3, 1909. Length, 67 mm.
2 examples, Nabatas Point, Samar. July 24, 1909. Length, 45 to 57 mm.
22436 and 22437. Port Caltom. December 15, 1908. Length, 51 to 68 mm.
3 examples, Rasa Island, Mantaquin Bay, Palawan. April 1, 1909. Length, 46 to 84 mm.
6 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 8 to 50 mm.
1 example, Sadaa, Celebes. November 17, 1909. Length, 66 mm.
27667 A.N.S.P. Batu Sangkar, Sumatra. Messrs. Harrison and Hiller. Length, 78 mm.
27651 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 45 mm.

Genus DASCYLLUS Cuvier

Dascyllus Cuvier, Règne Animal, ed. 2, vol. 2, 1829, p. 179. Type *Chaetodon aruanus* Linnaeus, monotypic.

Dascilus (Gronow) Gray, Ann. Mag. Nat. Hist. London, ser. 2, vol. 18, January, 1854, p. 44. Type *Chaetodon aruanus* Linnaeus.

Dascillus Gray, Cat. Fish. Gronow, vol. 2, 1854, p. 171. Type *Chaetodon aruanus* Linnaeus.

Pirene (not Haliday 1833) Gistel, Naturg. Thierr., 1848, p. ix. Type *Chaetodon aruanus* Linnaeus, virtually, as *Pirene* Gistel a substitute for *Dascyllus* Cuvier.

Tetradrachmum Cantor, Journ. As. Soc. Bengal (Cat. Malay. Fish.), vol. 18 (2), 1849 (1850), p. 1223. Type *Chaetodon arcuatus* Shaw, monotypic.

Orbicular. Head deeper than long. Upper jaw protractile. Teeth in narrow band in jaws, small, slender, pointed, outer row somewhat enlarged. Preopercle and sometimes preorbital serrated. Gills 3½. Pseudobranchiae present. Branchiostegals 5. Air-vessel large. Pyloric appendages 2 or 3. Scales moderate, 27 to 30 in lateral series. Snout scaly. Lateral line extends below soft dorsal. Dorsal with 12 or 13 spines, rays 12 to 16. Anal spines 2, rays 12 to 15. Caudal little emarginate.

Indo Pacific.

ANALYSIS OF THE SPECIES

*a*¹. Pellochromis, new subgenus. Dark or dusky generally, largely uniform, without transverse black bands.

*b*¹. Caudal little emarginate; young and adults with whitish dorsal spot and young with single white predorsal spot ---------- trimaculatus.

b^2. Caudal moderately emarginate; body lighter; young and adults with obscure transverse dark band, but without dorsal or nuchal spot. **marginatus.**

a^2. DASCYLLUS. Ground color white, with 3 black transverse bands, strongly contrasted.

c^1. Caudal largely black ---------- **melanurus.**

c^2. Caudal white ---------- **aruanus.**

PELLOCHROMIS, new subgenus

Type.—Pomacentrus trimaculatus Rüppell.

Coloration dusky or sombre, largely uniform and without broad black vertical bands.

(πελλος, dark; *Chromis;* with reference to the dark or dull coloration.)

DASCYLLUS TRIMACULATUS (Rüppell)

Pomacentrus trimaculatus RÜPPELL, Atlas Reis. Nördl. Afr., Fische, 1828, p. 39, pl. 8, fig. 3. Massaua, Red Sea.

Dascyllus trimaculatus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 441 (Massaua).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 13 (Red Sea, Mauritius, Mozambique, Amboina, Louisiades, Aneiteum, type of *D. unicolor* and *Pomacentrus nuchalis*); Fishes of Zanzibar, 1866, p. 81 (Aden, Zanzibar).—CAPELLO, Journ. Soc. Lisboa, 1871, p. 281 (Mozambique).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 519 (Koseir, Red Sea).—CARTIER, Verh. Ges. Würzburg, vol. 5, 1874, p. 97 (Ubay, Bohol).—GÜNTHER, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 236 (Red Sea, East Africa, East Indies, Society Islands, Kingsmills, Pelew Islands, Yap, Louisiades, Aneiteum, Hawaiian Islands).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).—WEBER, Zool. Forsch. Astral. Ritter Semon, vol. 5, 1895, p. 27 (Ambon).—FOWLER, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 553 (Padang, Sumatra).—REGAN, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 229 (Cargados Carajos).—JORDAN and SEALE, Bull. Bur. Fish., vol. 27, 1906 (1907), p. 27 (Manila).—REGAN, Ann. Durban Mus., vol. 1, 1914–1917, p. 459 (Durban, Natal).—FOWLER, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Tetradrachmum trimaculatus BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 8; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 144 (Sumatra, Java, Bali, Celebes, Batjan, Buru, Amboina, Haruco, Ceram, Banda, Goram).

Tetradrachmum trimaculatum DAY, Fishes of India, Suppl., 1888, p. 801; Fauna British India, vol. 2, 1889, p. 379.—STEINDACHNER, Abhandl. Senckenberg. Ges., vol 25, 1900, 439 (Halmaheira and Ternate).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 356) (West New Guinea, Lucipara Island, Banda).

Pomacentrus nuchalis BENNETT, Life of Raffles, 1830, p. 688. Sumatra.

Dascyllus unicolor BENNETT, Proc. Comm. Zool. Soc. London, vol. 1, 1831, p. 127. Mauritius.

Dascyllus niger BLEEKER, Verh. Batav. Genoot. (Labr.), vol. 21, 1846–1847, p. 10. Java.

Sparus nigricans (part) GRAY, Cat. Fish. Gronow, vol. 2, 1854, p. 61. India.

Dascyllus albisella GILL, Proc. Acad. Nat. Sci. Phila., 1862, p. 149. Hawaiian Islands.

Depth 1⅔; head 3 to 3⅓; width 1½ to 1⅗. Snout 3 to 3⅛; eye 2⅖ to 2⅘, greater than snout, 1 to 1⅛ in interorbital; maxillary reaches front eye edge or front pupil edge, 2⅘ to 3 in head; an outer series of enlarged conic, simple teeth and an irregular biserial inner band of minute teeth; interorbital 2⅗ to 2⅘, broadly convex; preorbital and antero-infraorbitals free, lower edges minutely serrated; preopercle edge minutely serrated. Gill rakers 6+17, slender, rather long.

Tubes in lateral line 19 or 20, pores in straight section 8 or 9, sometimes somewhat tubular, to caudal base and 0 to 2 more on latter; 4 scales above lateral line, 11 or 12 below, 28 to 30 predorsal forward to snout end; preorbital with 2 or 3 rows of scales, 1 row on infraorbitals and 5 more rows on cheek. Scales with 5 to 7 basal radiating striae, edges scalloped; apical denticles 78 to 143, basal elements in 2 to 4 transverse series; circuli very fine.

D. XI or XII, 15, 1, third spine 1⅖ to 1½ in head, sixth ray 1⅓ to 1⅖; A. II, 13, 1, second spine 1⅖, fourth ray 1⅓ to 1⅖; caudal 3 in combined head and body, little emarginate and upper lobe slightly longer; least depth of caudal peduncle 1⅘ to 1⅞ in head; pectoral 3 to 3⅛ in combined head and body; ventral 2⅔ to 2⅘.

Bister to olive-brown, each scale with slightly paler center. Often some walnut brown shades on head or front of body, sometimes on caudal peduncle. Iris deep brown. Round white spot, size of pupil, above lateral line and below seventh and eighth dorsal spines. Vertical fins and ventrals seal-brown to blackish. Pectoral brown, like body color, with small dusky brown spot at origin.

Red Sea, East Africa, Mauritius, India, East Indies, Melanesia, Micronesia, Polynesia, Hawaii. The young often have a white blotch extending well down on the side of the body, besides a white blotch at the nape. Some also have the soft vertical fins whitish.

11122. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 115 mm.
1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 98 mm.
1 example, Bagacay Bay, Escarpada Island, Maranjos Group. March 13, 1909. Length, 132 mm.
1 example, Bolinao Bay. May 10, 1909. Length, 35 mm.
1 example, Buang Bay, Talajit Island. March 15, 1909. Length, 114 mm.
1 example, Bugsuk Island, Balabac. January 5, 1909. Length, 64 mm.
2 examples, Burias Island, Alimango Bay. March 5, 1909. Length, 71 to 102 mm.
1 example, Busin Harbor, Burias Island. March 8, 1909. Length, 90 mm.
7 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 36 to 120 mm.
12741. 9 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 30 to 97 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 80 mm.
3 examples, Caxisigan Island. January 2, 1909. Length, 75 to 112 mm.

7423. Dalaganem Island. April 8, 1909. Length, 77 mm.
3 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 94 to 103 mm.
3 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 35 to 39 mm.
3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 70 to 125 mm.
9909 and 9910. Inamucan Bay, Mindanao. August 8, 1909. Length, 80 to 102 mm.
3 examples, Inamucan Bay, Mindanao. August 9, 1909. Length, 60 to 77 mm.
1 example, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 106 mm.
1 example, Limbones Cove. February 8, 1909. Length, 70 mm.
1 example, Little Santa Cruz Bay. May 28, 1908. Length, 75 mm.
8 examples, Mactan Cove, Mactan Island. April 6, 1908. Length, 70 to 100 mm.
1 example, Mactan Island, Cebu. March 25, 1909. Length, 108 mm.
13542. 4 examples, Makyan Island. November 29, 1909. Length, 75 to 108 mm.
2 examples, Malapascua Island. March 16, 1909. Length, 82 to 103 mm.
5 examples, Malanipa Island. September 8, 1909. Length, 50 to 127 mm.
1 example, Mindoro. June 9, 1908. Length, 110 mm.
2 examples, Murcielagos Bay. August 9, 1909. Length, 95 to 110 mm.
8739 B. F. Northwest Verde Island. July 22, 1908. Length, 66 to 133 mm. 6 examples.
22 examples, Opol, Mindanao. August 4, 1909. Length, 53 to 118 mm.
11411. Paluan Bay, Mindoro. December 11, 1908. Length, 85 mm.
2 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 70 to 82 mm.
1 example, Pandanon Island. March 23, 1909. Length, 70 mm.
7 examples, Pangasinan Island. February 13, 1908. Length, 63 to 95 mm.
5 examples, Pasacao, Ragay Gulf. March 9, 1909. Length, 75 to 115 mm.
1 example, Philippines. Length, 94 mm.
12931. 6 examples, Pilas Island. September 12, 1907. Length, 88 to 120 mm.
11 examples, Polloc, Mindanao. May 22, 1908. Length, 57 to 110 mm.
12439 and 19963. 5 examples, Port Galera, Mindoro. October 27, 1909. Length, 82 to 110 mm.
10511. 11 examples, Port Maricaban. July 21, 1908. Length, 66 to 110 mm.
2 examples, Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 114 to 128 mm.
12183, 12184, 20783. 5 examples, Powati Harbor, Makyan Island. November 28, 1909. Length, 68 to 120 mm.
20931. Puerta Princessa, Palawan. April 5, 1909. Length, 68 mm.
5 examples, Sablayan, Mindoro. December 12, 1908. Length, 46 to 73 mm.
12218. Santa Cruz Island, Marinduque. April 24, 1908. Length, 113 mm.
2 examples, Simaluc, Bisibisi. September 23, 1909. Length, 86 to 116 mm.
1 example, Sipadan Island. September 28, 1909. Length, 82 mm.
12603. Sitanki Wharf. February 26, 1908. Length, 124 mm.
11495 and 11496. 3 examples, Sulade Island. September 17, 1909. Length, 102. to 117 mm.
4 examples, Taganak Island. January 7, 1909. Length, 26 to 90 mm. [1046 to 1049.]

2 examples, Tumindao Island, reefs of south lagoon. February 26, 1908. Length, 80 to 110 mm. [340 to 342.] Olive-drab, middle of side lighter; edges of scales with darker, somewhat blotched at tips, giving rise to longitudinal lines; head with purple shades. Dorsal body color, at base, beyond scales black; soft portion with slaty shades, becoming hyaline terminally. Caudal smoky, flushed with yellowish at base on peduncle. Anal base body-color, tips of spines and first ray black; soft fin slaty purple, paling at tip. Ventral blackish. Pectoral smoky hyaline with blackish blotch at upper base. Dark shades on edge of opercle and shoulder above. Iris brownish, eye under rim of orbit black.

1 example, Tulnalutan Island. September 9, 1909. Length, 135 mm.

1 example, Tutu Bay, Jolo Island. September 19, 1909. Length, 110 mm.

21484. 4 examples, Tifu Bay, Bouro Islands. December 10, 1909. Length, 26 to 118 mm.

1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 118 mm.

1 example, Dodepo and Pasejogo Islands, Celebes. November 19, 1909. Length, 75 mm.

1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 80 mm.

12771. Limbe Strait, Celebes. November 10, 1910. Length, 112 mm.

1 example, Sadaa, Celebes. November 17, 1909. Length, 90 mm.

1 example, Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. Length 124 mm.

1 example, Tidore Island, south of Ternate. November 24, 1909. Length 95 mm.

49291 U.S.N.M. Red Sea. Bellotti. 1 example. Length, 104 mm.

51131 U.S.N.M. Hawaiian Islands. U. S. F. Com. 1 example. Length, 115 mm.

52208 U.S.N.M. Samoa. Bureau of Fisheries. 1 example. Length, 75 mm.

55214 U.S.N.M. Hawaiian Islands. *Albatross.* 1 example. Length, 48 mm.

55322 U.S.N.M. Honolulu. *Albatross.* 12 examples. Length, 13 to 60 mm.

55379 U.S.N.M. Honolulu. *Albatross.* 4 examples. Length, 79 to 117 mm.

65813 U.S.N.M. Jaluit, Marshalls. *Albatross.* 1 example. Length, 120 mm.

6274 U.S.N.M. Honolulu, Hawaiian Islands. W. H. Pease. 4 examples. Types of *Dascyllus albisella.*

9615 to 9618 A.N.S.P. Hawaiian Islands. Thomas Nuttall. [Discarded.]

9619 A.N.S.P. Oahu, Hawaiian Islands. Dr. W. H. Jones. 1 example. Length, 35 mm.

27669 to 27671 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 90 to 95 mm.

DASCYLLUS MARGINATUS (Rüppell)

Pomacentrus marginatus RÜPPELL, Atlas Reis. Nördl. Afr., Fische, 1828, p. 38, pl. 8, fig. 2. Massaua, Red Sea.

Dascyllus marginatus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 439, pl. 133 (Red Sea).—GUERIN-MENEVILLE, Icon. Règne Animal Cuvier, vol. 4, 1830–44, pl. 19, fig. 6.—STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 1, 1861, p. 77 (no locality).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 14 (Red Sea); Fishes of Zanzibar, 1866, p. 81 (Aden, Zanzibar).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 520 (Koseir, Red Sea).—KOSSMANN and RÄUBER, Zool. Ergebn. K. Acad. Wiss. Berlin, vol.

1, 1877, p. 23 (Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 381, pl. 79, fig. 7; Fauna British India, vol. 2, 1889, p. 380, fig. 127.—Sauvage, Hist. Madagascar, Poiss. 1891, p. 422.—Borsieri, Ann. Mus. Civ. Genova, (3), vol. 4, 1904, p. 214 (Massaua, Dilemmi, Entufasch Island).—Bamber, Journ. Linn. Soc. London, vol. 31, 1915, p. 481 (between Suez and Suakim).

Heliases reticulatus Richardson, Rep. Brit. Assoc. Adv. Sci. (Fish. Chin. Jap.), 1845 (1846), p. 254. China Seas.

Dascyllus reticulatus Cartier, Verh. Ges. Würzburg, 1873, p. 97 (Bohol).—Elera, Cat. Faun. Filip., vol. 1, 1895, p. 544 (Bohol, Cebu).

Tetradrachmum reticulatum Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 3; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 145 (Nias, Borneo, Buru, Amboina, Ceram, Banda, Goram, Philippines).—Steindachner, Abhand. Senckenberg. Ges., vol. 25, 1900, p. 439 (Ternate).—Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 129 (Ambon.)—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 356 (Sanguisiapo in Sulu Archipelago, Borneo Bank, Damar, Ambon).

Dascyllus xanthosoma Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 247. Banda Neira.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 14 (Borneo); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 237, pl. 124, fig. C (East Indies, Kandavu, New Britain, Ponape).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 543 (Luzon, Manila).

Pomacentrus unifasciatus Kner, Sitz. Akad. Wiss. Wien, vol. 57 (1), 1868, p. 348, pl. 8, fig. 24. Kandavu.

Gliphidodon bimaculatus Macleay, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 271. Southeast coast of New Guinea.

Dascyllus nigripinnis Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 228, pl. 24, fig. 5. Maldives.

Dascyllus trimaculatus (not Rüppell) Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 1½ to 1⅔; head 3 to 3⅕, width 1½ to 1⅔. Snout 3⅛ to 3½; eye 2¾ to 2⅘, greater than snout or interorbital; maxillary reaches opposite front pupil edge in young, but slightly beyond front eye edge with age, 3 to 3⅛ in head; teeth in 3 or 4 irregular series, conic, simple, outer row little enlarged; interorbital 2⅗ to 2⅘, broadly and slightly convex; preorbital, infraorbital, and preopercle edges free, minutely and inconspicuously serrated. Gill rakers 7+18, slender, lanceolate, rather long.

Tubes in lateral line 17 or 18, followed by 3 or 4 irregular pores; pores in straight section 9 or 10+0 to 2; 4 scales above lateral line, 11 below, 21 to 24 predorsal forward to snout tip; row of scales on infraorbitals and 4 more rows on cheeks. Scales with 7 basal radiating striae, edge scalloped; 73 to 127 apical denticles, with 1 or 2 transverse series of basal elements; circuli very fine.

D. XII, 14, 1, third spine 1⅕ to 1⅖ in head, fifth ray 1⅓ to 1½; A. II, 12, 1 or 13, 1, second spine 1⅘ to 2$\frac{1}{10}$, fourth ray 1⅓ to 1⅖; caudal emarginate, 3⅛ to 3⅓ in combined head and body; least depth of caudal peduncle 1⅘ to 2 in head; pectoral 1 to 1⅛; ventral 3¼ to 3⅓ in combined head and body.

Pale brownish generally, head and body uniform or sometimes with deeper brown obscure band from below front of spinous dorsal to pectoral axil. Iris brownish. Spinous dorsal and ventral blackish-brown to black, fins otherwise all pale brown.

Red Sea, Madagascar, India, East Indies, Philippines, Melanesia, Micronesia, Polynesia.

2 examples, Alimango Bay, Burias Island. March 5, 1909. Length, 50 to 70 mm.
11 examples, Biri Channel. June 1, 1909. Length, 81 to 94 mm.
4 examples, Biri Channel. June 2, 1909. Length, 51 to 75 mm.
1 example, Bulan Island, Samales Group. September 13, 1909 Length, 61 mm.
3 examples, Butauanan Island. June 13, 1909. Length, 68 to 73 mm.
1 example. Canimo Island, near Daet. June 15, 1909. Length, 70 mm.
14 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 38 to 72 mm.
1 example, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 63 mm.
3 examples, Dalaganem Island. April 8, 1908. Length, 65 to 78 mm.
2 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 56 to 63 mm.
10313. Endeavor Strait. September 23, 1908. Length, 68 mm.
5 examples, Gandra Island. September 20, 1909. Length, 57 to 76 mm.
1 example, Guntao Island. December 20, 1908. Length, 52 mm.
9906. Inamucan Bay, Mindanao. August 8, 1909. Length, 54 mm.
3 examples, Jolo. March 6 and 7, 1908. Length, 65 to 80 mm.
2 examples, Labuan Blanda Island. December 14, 1909. Length, 64 to 77 mm.
1 example, Little Santa Cruz Island. May 28, 1908. Length, 65 mm.
19 examples, Mactan Cove, Mactan Island. April 6, 1908. Length, 62 to 90 mm.
2 examples, Maitara Island. November 26, 1909. Length, 61 to 78 mm.
21622. Machesi Island, Palawan. April 5, 1909. Length, 78 mm.
23 examples, Maricaban Island, Luzon. January 20, 1908. Length, 55 to 85 mm.
1 example, Northwest Verde Island. July 22, 1908. Length, 48 mm.
5 examples, Opol, Mindanao. August 4, 1909. Length, 50 to 68 mm.
1 example, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 75 mm.
11409. Paluan Bay, Mindoro. December 11, 1908. Length, 75 mm.
1 example, Philippines. Length 65 mm.
7 examples, Pilas Island. September 12, 1909. Length, 45 to 74 mm.
4 examples, Polloc, Mindanao. May 22, 1908. Length, 56 to 71 mm.
1 example, Port Caltom. December 15, 1908. Length, 81 mm.
3 examples, Port Galera, Mindoro. October 27, 1909. Length, 60 to 80 mm.
10318 and 10319. 19 examples, Port Maricaban. July 21, 1908. Length, 41 to 78 mm.
1 example, Port Palapag. June 3, 1909. Length, 39 mm.
8 examples, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 48 to 83 mm.
3 examples, Powati Harbor, Makyan Island. November 28, 1909. Length, 68 to 89 mm.
2 examples, Sablayan, Mindoro. December 13, 1908. Length, 74 to 78 mm.
2 examples, Simaluc Island. September 22, 1909. Length, 60 to 68 mm.
4 examples, Sitanki Reef. September 24, 1909. Length, 55 to 78 mm.
11492 and 11493. 5 examples, Sulade Island. September 17, 1909. Length, 55 to 77 mm.

1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 63 mm.
2 examples, Tidore Island, south of Ternate. November 24, 1909. Length, 60 to 68 mm.
2 examples Tidore Island. November 25, 1909. Length, 52 to 56 mm.
2671 U.S.N.M. Zanzibar. British Museum. 2 examples. Length, 43 to 50 mm.
84086 U.S.N.M. Hawaiian Islands. One example, 110 mm. Like Bleeker's figure, evidently bleached out.
48833 to 48842 A.N.S.P. Philippines. Commercial Museum Philadelphia.

Subgenus Dascyllus Cuvier

Handsome and strikingly colored, easily distinguished by the white general color. With 3 broad black vertical bands, which disposed a little differently in the 2 species.

DASCYLLUS MELANURUS Bleeker

Dascyllus melanurus Bleeker, Nat. Tijds. Ned. Indie, vol. 6, 1854, p. 100. Neira, Banda.—Günther, Cat. Fish. Brit. Mus., vol 4, 1862, p. 12 (Molucca Sea, Amboina).—Martens, Preuss. Exp. Ost Asien, 1876, p. 396 (Amboina).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 236, pl. 124, fig. C (East Indies, Ponape).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Manado).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (Ambon).—Regan, Trans. Linn. Soc. London, (2) Zool., 1, vol. 12, 1907, p. 229 (Maldives, Felidu).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 264 (Cagayancillo).

Tetradrachmum melanurus Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 1; Nat. Verh. Holl. Maatsch, Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 149 (Sumatra, Bawean, Celebes, Sumbawa, Flores, Timor, Ternate, Obi major, Buru, Amboina, Ceram, Goram, Guebe, New Guinea).—Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 129 (Ambon).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 357 (Borneo Bank, Elat).

Tetradrachmum melanurum Steindachner, Abhand. Senckenberg. Ges., vol. 25, 1900, p. 438 (Ternate).—Weber, Abhand. Senckenberg, Ges., vol. 34 (1), 1911, p. 7 (Kei Islands).

Pomacentrus onyx De Vis, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 451. South Seas.

Depth 1⅗ to 1⅔; head 3; width 1⅔ to 1¾. Snout 4; eye 2¾ to 2⅘, little greater than snout or interorbital; maxillary reaches slightly beyond front eye edge, 2⅔ to 2⅘ in head; teeth conic, with outer enlarged row and inner band of 1 or 2 irregular rows of smaller ones; interorbital 2¾ to 2⅞, broadly convex; infraorbital and preopercle edges finely denticulate. Gill rakers 5+17, lanceolate, slender, rather long.

Tubes in lateral line 14 to 17, pores in straight section 7+2; 3 scales above lateral line to spinous dorsal origin, 7 to 9 below, 24 to 27 predorsal; 4 rows of cheek scales, uppermost row on infraorbitals. Scales with 6 to 8 basal radiating striae; apical denticles 91 to 115 with single row of basal elements.

D. XI or XII, 12, 1, fifth spine 1⅖ to 1⅔ in head, fifth ray 1¼ to 1⅓, first ray often simple; A. II, 12, 1, second spine 1⅘ to 2, fourth ray 1¼ to 1⅓; caudal emarginate, broad, 2¾ in combined head and body; pectoral 3; ventral 2⅖ to 2⅗; least depth of caudal peduncle 1¾ to $1\frac{9}{10}$ in head.

White, some examples with grayish tinge on back and head above. Broad black band from occiput above downward to include eye, all of mandible, front of cheek and chest, but lips pale. Second broad black band from front of spinous dorsal to ventral, which also black. Third black band includes last dorsal spine and most of soft dorsal down to soft anal, leaving narrow white edge to soft dorsal and anal posteriorly. Caudal whitish, with large black marginal blotch behind, reaching to middle of fin. Pectoral pale or gray, base black. Iris dusky.

East Indies, Melanesia, Micronesia.

Greatly like *Dascyllus aruanus*, though readily distinguished by the large black caudal blotch, the fin appearing largely if not entirely black.

1 example Batan Island. June 5, 1909. Length, 63 mm.

3 examples, Biri Channel, Balicuatro Island. June 1, 1909. Length 55 to 67 mm. [1549.] Ground-color dusky-silver below, becoming greenish above; black band, breadth of eye, from top of head through eye, covering all of chin and most of throat; second black band covers all of front of dorsal, including 5 spines, passes downward to base of ventral, which entirely black; third from soft dorsal to soft anal, coloring fins except narrow vertical margin, which hyaline; caudal black except very narrow whitish margin basally and tip.

1 example, Buang Bay, Talajit Island. March 15, 1909. Length, 57 mm.

1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 60 mm.

1 example, Galera Bay, Mindoro. June 9, 1908. Length, 42 mm.

1 example, Guiniyan Island. June 4, 1909. Length, 50 mm.

1 example, Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 36 mm.

2 examples, Mansalay, Mindoro. June 4, 1908. Length 58 to 72 mm.

2 examples, Philippines. Length, 52 to 55 mm.

1 example, Port Maricaban. July 21, 1908. Length, 65 mm.

1 example, Port Palapag. June 2, 1909. Length, 58 mm.

1 example, Rapu Rapu Island. June 22, 1909. Length, 40 mm.

14050 and 14051. Sacol Island. September 9, 1909. Length, 52 to 57 mm.

1 example, Tataan, Simulac Island. February 18, 1908. Length, 68 mm.

1 example, Tumindao Island. February 26, 1908. Length, 39 mm.

20686. Ulugan Bay, mouth of Baheli River. December 28, 1908. Length, 58 mm.

DASCYLLUS ARUANUS (Linnaeus)

Chaetodon aruanus Linnaeus, Syst. Nat., ed. 10, 1758, p. 275. Indies.—Bloch, Naturg. Ausl. Fisch., vol. 3, 1787, p. 62, p. 198 (India, Arabia).

Chetedon aruanus Bonnaterre, Tabl. Ich., 1788, p. 87, pl. 92, fig. 380 (East Indies, Red Sea).

Lutjanus aruanus LACÉPÈDE, Hist. Nat. Poiss., vol. 4, 1803, pp. 719, 720 (on LINNAEUS).

Pomacentrus aruanus RÜPPELL, Atlas Reis. Nörd. Afr., Fische, 1828, p. 39 (Red Sea).

Dascyllus aruanus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 434 (Borabora, Tongatabu, Oualan, Guam, New Ireland, Mauritius, Red Sea, Massuah).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 12 (Red Sea, Pinang, Amboina, Molucca Sea, East Indies, China, Fiji, Tongatabu, Tanna, "New Zealand").—KNER, Reise Novara, Fisch., pt. 2, 1865, p. 241 (Nicobars, Madras, Tahiti).—GUICHENOT, Mem. Soc. Nat. Cherbourg, ser. 2, vol. 2, 1866, p. 145 (Madagascar).—GÜNTHER, Fishes of Zanzibar, 1866, p. 81 (Berbera and Zanzibar).—PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 271 (Indian Ocean in S. Lat. 27°).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 518 (Kosier, Red Sea).—CASTELNAU (Res. F. Austral.) Victor. Off. Rec. Phila. Expos. 1875, p. 33 (Queensland).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 442 (Mauritius).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 396 (Amboina).—KOSSMANN and RÄUBER, Zool. Ergeb. K. Akad. Wiss. Berlin, vol. 1, 1877, p. 23 (Red Sea).—GÜNTHER, Philos. Trans. Roy. Soc., vol. 168, 1879, p. 470 (Rodriguez).—KÁROLI, Termez. Füzetek, Budapest, vol. 5, 1881, p. 172 (Ceylon).—GÜNTHER, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 235, pl. 124, fig. B (Red Sea, East Africa, South Sea).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (North Celebes, Cebu, Mysore).—WEBER, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (Ambon).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 543 (Cebu).—BORSIERI, Ann. Mus. Civ. Genova, ser. 3, vol. 1, 1904, p. 215 (Massaua, Red Sea).—FOWLER, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 533 (Padang, Sumatra).—JORDAN and SEALE, Bull. Bur. Fish., vol. 26, 1906 (1907), p. 27 (Cavite).—REGAN, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 229 (Maldives; Chagos Archipelago, Egmont and Solomon).—MCCULLOCH, Rec. Austral. Mus., vol. 9, pt. 3, 1913, p. 360 (Murray Island).—BAMBER, Journ. Linn. Soc. London, vol. 31, 1915, p. 481 (between Suez and Suakim).—FOWLER, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).—FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 49 (Zamboanga).

Tetradrachmum aruanum BLEEKER, Poiss. Madagascar Reunion, 1874, p. 65.—DAY, Fishes of India, pt. 3, 1877, p. 381, pl. 80, fig. 6; Faun. Brit. India, vol. 2, 1889, p. 380.—STEINDACHNER, Abhand. Senckenberg. Gesell., vol. 25, 1900, p. 438 (Batjan, Ternate).—FOWLER, Proc. Acad. Nat. Sci. Phila., 1907, p. 433 ("Victoria, Australia," though likely Polynesia or Fiji).—WEBER, Abhandl. Senckenberg. Nat. Gesell., vol. 34 (1), 1911, p. 7 (Kei Islands).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 129 (Ambon).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 357 (Sailusketjil Island, Sumba, Borneo Bank, Sebangkatan, Celebes Sea, Muaras Reef, Sanguisapo in Sulu Archipelago, Damar, Saleyer, Tual).

Chaetodon arcuatus (part) LINNAEUS, Syst. Nat., ed. 10, 1758, p. 273. Indies.

Tetradrachmum arcuatum CANTOR, Journ. As. Soc. Bengal (Cat. Malay. Fish.), vol. 18 (2), 1849 (1850), p. 223 (Pinang).—BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 6; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 147 (Sumatra, Batu, Nias, Pinang, Cocos Islands, Bawean, Celebes, Sangi, Sumbawa, Flores, Solor, Timor, Ternate, Buru, Amboina, Harucu, Ceram, Obi major, Banda, Goram, Aru, Guebe, Waigiu).

Chaetodon abu-dafar Forskål, Descript. Animal., 1775, pp. xiii, 65. Djedda, Red Sea.

Pomacentrus emamo Lesson, Voy. Coquille, Zool., vol. 2 (1), 1830, p. 190. Borabora, Society Islands.

Chaetodon arancus Bennett, Fishes of Ceylon, 1834, pl. 17. Ceylon.

Pomacentrus trifasciatus (not Rüppell) De Vis, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 452. Probably South Seas.

Pomacentrus devisi Jordan and Seale, Bull. Bur. Fish., vol. 25, 1905 (1906), p. 284 (on De Vis).

Depth 1¾ to 1⅞; head 2⅗ to 3⅛, width 1⅔ to 1⅘. Snout 3¼ to 4¼; eye 2⅓ to 2⅘, greater than snout or interorbital, equals interorbital with age; maxillary reaches eye, slightly beyond front edge in young, 3 to 3¼ in head; teeth simple, conic, in 3 or 4 irregular series in jaws, outer little enlarged; interorbital 2¾ to 3, slightly convex; preorbital, infraorbitals and preopercle edges free, denticulate. Gill rakers 6 + 17, slender, lanceolate, long.

Tubes in lateral line 16 to 18, followed by 2 or 3 irregular pores; pores in straight section 7 to 9 + 1 to 3; 3 scales above lateral line, 10 below, 25 to 30 predorsal forward to snout tip; cheek with 1 or 2 rows of scales on infraorbitals and 4 more rows below. Scales with 8 to 10 basal radiating striae, basal edge scalloped; 57 to 115 apical denticles, in 1 to 3 transverse series, very small; circuli fine.

D. XII, 12, fifth spine 1⅖ to 1¾ in head, fifth ray 1⅖ to 2⅔; A. II, 12, I or 13, I, second spine 1⅞ to 2, fourth ray 1⅓ to 1⅖; caudal emarginate, lobes distinct, 1 to 1¼; least depth of caudal peduncle 1⅞ to 2; pectoral 1⅛ to 1⅙; ventral 2½ to 3⅖ in combined head and body.

Ground color white. Black band from front of spinous dorsal to eye, then forward to include preorbital, snout tip narrowly and all of mandible. Second black band from middle of spinous dorsal down to pectoral and ventral bases. Third black band from front half of soft dorsal down to include greater part of anal. Ventrals, black, caudal and pectoral whitish. Iris brownish.

Abundant and widely distributed throughout the Indo-Pacific, from the Red Sea, East Africa, and Mauritius to India, East Indies, Philippines, Melanesia, Micronesia, Polynesia, and Hawaii.

2 examples, Batan Island. June 5, 1909. Length, 48 to 59 mm.

1 example, Biri Channel. June 1, 1909. Length, 60 mm.

3 examples, Bubuan Island, Jolo. February 14, 1908. Length, 34 to 54 mm.

1 example, Bugsuk, Balabac. January 5, 1909. Length, 60 mm.

2 examples, Candaraman Island, Balabac. January 4, 1909. Length, 48 to 58 mm.

14 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 40 to 58 mm.

2 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 47 to 49 mm.

2 examples, Cebu market. August 28, 1909. Length, 46 to 55 mm. [1851.]

4 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 43 to 53 mm.

1 example, Galera Bay, Mindoro. June 9, 1905. Length, 50 mm.
3 examples, Isabel, Basilian. September 11, 1909. Length, 45 to 60 mm.
22429. 5 examples, Jolo. March 7, 1908. Length, 50 to 62 mm.
1 example, Little Santa Cruz Island. May 28, 1908. Length, 58 mm.
1 example, Mactan Island, Cebu. March 25, 1909. Length, 55 mm.
33 examples, Marongas Island, shore coral head. February 10, 1908. Length, 16 to 65 mm.
20291. Palag Bay vicinity, Luzon. June 16, 1909. Length, 63 mm.
6 examples, Pandanan Island. March 23, 1909. Length, 22 to 53 mm.
11 examples, Pandanan Island. March 24, 1909. Length, 38 to 46 mm. [1473.]
1 example, Pangasinan Island. February 13, 1908. Length, 40 mm.
1 example, Pilas Island. September 12, 1909. Length, 50 mm.
2 examples, Polloc, Mindanao. May 22, 1908. Length, 49 to 56 mm.
2 examples, Port Banalacan, Marinduque. February 23, 1909. Length, 49 to 56 mm.
2 examples, Port Maricaban. July 21, 1908. Length, 49 to 58 mm.
16539. Port Matalvi, Luzon. November 22, 1908. Length, 64 mm.
1 example, Port Matalvi, Luzon. November 23, 1908. Length, 56 mm.
3 examples, Romblon. March 26, 1908. Length, 46 to 60 mm.
1 example, Sacol Island. September 9, 1909. Length, 48 mm.
4 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 37 to 58 mm.
36 examples, Simaluc, Bisibisi Island. September 23, 1909. Length, 21 to 55 mm.
19538. Singaan Island. September 21, 1909. Length, 64 mm.
2 examples, Sulade Island. September 17, 1909. Length, 33 to 57 mm.
1 example, Surigao, Mindanao. May 8, 1908. Length, 60 mm.
1 example, Taganak Island. January 7, 1909. Length, 43 mm.
5 examples, Tapiantana Island. September 13, 1909. Length, 39 to 62 mm.
3 examples, Tara Island. December 14, 1908. Length, 28 to 43 mm.
1 example, Tara Island. December 15, 1909. Length, 58 mm.
7 examples, Tataan, Simaluc Island. February 18, 1908. Length, 25 to 60 mm.
1 example, Tataan. February 20, 1908. Length, 37 mm.
3 examples, Tomahu Island. December 11, 1909. Length, 30 to 48 mm.
6 examples, Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 27 to 59 mm.
2 examples, Tulayan Island. September 15, 1909. Length, 45 to 60 mm.
13147 and 13148. Tumindao Island, reefs south lagoon. February 26, 1908. 4 examples. Length, 21 to 58 mm.
1 example, Tutu Bay, First Anchorage, Jolo Island. September 19, 1909. Length, 54 mm.
1 example, Tifu Bay, Bouro Island. December 10, 1909. Length, 45 mm.
1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 64 mm.
21401. Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 41 to 58 mm.
20513 U.S.N.M. Samoa. Dr. T. H. Streets. 28 examples. Length, 18 to 46 mm.
28556 U.S.N.M. Madagascar. Paris Museum. 6 examples. Length, 32 to 47 mm.
28557 U.S.N.M. Lonlou Islands. Paris Museum. 3 examples. Length, 37 to 53 mm.

30671 U.S.N.M. New Guinea. Linnaean Society, New South Wales. 2 examples. Length, 62 to 67 mm.
45067 U.S.N.M. Tahiti. British Museum. 1 example. Length, 52 mm.
52204 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 41 examples. Length, 22 to 58 mm.
56300 U.S.N.M. Cavite. Dr. G. A. Lung. 2 examples. Length, 27 to 45 mm.
65472 U.S.N.M. Mangareva, Gambier Islands. 20 examples. Length, 68 to 78 mm.
65811 U.S.N.M. Fakarava, Paumotus. 3 examples. Length, 32 to 59 mm.
83961 U.S.N.M. No locality. *Albatross* collection. 5 examples. Length, 34 to 63 mm.
84247 U.S.N.M. Zamboanga. Dr. E. Baker. 7 examples. Length, 35 to 67 mm.
9620 and 9621 A.N.S.P. Tahiti. Andrew Garrett. Length, 42 to 50 mm.
27668 A.N.S.P. Batu Sangkar, Sumatra. Messrs. Harrison and Hiller. Length, 58 mm.
31165 A.N.S.P. Apia, Samoa. Bureau of Fisheries.
33165 A.N.S.P. "Victoria, Australia," but likely from Fiji. Mrs. A. F. Kenyon.
48703 to 48716 A.N.S.P. Philippines. Commercial Museum, Philadelphia.
51177 to 51179 A.N.S.P. Pago Pago, Samoa. Capt. C. F. Silvester.

Genus LEPIDOZYGUS Günther

Lepidozygus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 15. Type *Pomacentrus tapeinosoma* BLEEKER, monotypic.

Teeth uniserial, small, subconic. Preopercle slightly serrated. Preorbital distinct, other suborbitals and preopercular limb hidden by scales. Scales of moderate size, 36 in a lateral series. Dorsal spines 12. Anal spines 2. Caudal forked. Dull olive.

Of peculiar physiognomy and quite different in general appearance from any of the other genera.

LEPIDOZYGUS TAPEINOSOMA (Bleeker)

Pomacentrus tapeinosoma BLEEKER, Nat. Tijds. Ned. Indie, vol. 10, 1856, p. 376. Ternate.

Lepidozygus tapeinosoma GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 15 (Ternate).—BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 1; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 71 (Ternate and Amboina).

Depth 2⅖ to 2⅔; head 3½ to 3⅗, width 1⅗ to 1¾. Snout 3⅖ to 3⅔; eye 3⅘ to 4⅕, 1 to 1⅕ in snout, 1⅖ to 1½ in interorbital; maxillary greatly inclined, reaches pupil, expansion 1¾ to 2 in eye, length 2¼ to 2⅗ in head; teeth uniserial, short, subconic, anterior largest and more obtuse; interorbital 2½ to 2⅞, convex; hind and lower edge of orbital socket with row of firm papillae; hind preopercular limb denticulate. Gill rakers 8+14, lanceolate.

Tubes in lateral line 19, sometimes followed by 3 or 4 pores, pores in straight section 15 or 16+5; 5 scales above lateral line to spinous dorsal origin, 6 below, 20 predorsal forward to nostril; scales on

caudal peduncle smaller than elsewhere on body, more crowded; bases of dorsals and anals with few rather large scales; caudal, except hind edge, finely scaled. Scales with 8 to 10 short basal radiating striae, edge scalloped; apical denticles 76 to 87, with 3 or 4 transverse series of basal elements; circuli very fine.

D. XII, 13 or 14, fourth spine 2¼ to 2½ in head, first branched ray 2 to 2⅙; A. II, 14 or 15, second spine 3 to 3⅛, first ray 2⅙ to 2⅕; pectoral 1 to 1$\frac{1}{10}$; ventral 1$\frac{1}{10}$ to 1⅛; least depth of caudal peduncle, 2$\frac{1}{10}$ to 2¼; caudal widely forked, 3 to 3⅙ in combined head and body, tips ending in filaments.

Back and upper surface uniform olive, under surface of head and abdomen soiled whitish. Most scales about humeral region with dark or neutral tint, sometimes as spot basally. Below eye towards pectoral base and parallel with lower front profile of body at least 3 poorly defined gray white streaks extending to thorax. Dorsals and anals dusky neutral. Caudal olive. Paired fins dull or light olive, usually dark spot in pectoral axil. Iris slaty.

Known only from the East Indies and Philippines.

A peculiar fish of sombre appearance, remarkable for its eye being deeper than wide and furnished along the hind edge of the eye socket with a fringe of papillae.

3 examples, Doworra Island. December 2, 1909. Length, 58 to 70 mm.

26 examples, Panpan, Tara Island. September 20, 1909. Length, 75 to 100 mm. Greenish above, becoming somewhat slaty on nape; margins of scales rather dusky; silvery with dusky and bluish on lower head and side; two or three pale stripes from eye and cheek to base of pectoral, showing only in certain lights. Dorsal slaty, with obscure oblique paler lines crossing about five membranes; last three rays pale orange. Caudal with purplish wash. Anal similar to dorsal. Ventrals pink. Pectorals hyaline pink. Chin with slight pinkish wash.

2 examples, Port Galera, Mindoro. October 27, 1909. Length, 84 to 88 mm.

5 examples, Uki, Bouro Island. December 9, 1909. Length, 73 to 77 mm.

1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 75 mm.

Pomacentrus obtusirostris Günther[5] may be synonymous. It is described: "The scales in the upper side of the head do not advance to the front margin of the orbit" and the "scales are marked with darker blue elongated spots arranged so as to form longitudinal lines." Günther's figure does not show the ocular papillae and the dorsals and anals are without the basal scales of our specimens. Though Bleeker's figure of *Lepidozygus tapeinosoma* is much better, the ocular papillae are also unnoticed. Regan reports *Pomacentrus obtusirostris* from the Persian Gulf.[6]

[5] Cat. Fish. Brit. Mus., vol. 4, 1862, p. 24. No locality.—Günther, Fishes of Zanzibar, 1866, p. 82, pl. 10, fig. 4 (Zanzibar).

[6] Journ. Bombay Soc. Nat. Hist., vol. 16, pt. 2, 1916, p. 336.

Genus ACANTHOCHROMIS Gill

Acanthochromis Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 214. Type *Dascyllus polyacanthus* Bleeker, orthotypic.

Homalogrystes Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 268. Type *Homalogrystes guntheri* Alleyne and Macleay, orthotypic.

Heptadecanthus Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1877, p. 343. Type *Heptadecanthus longicaudis* Alleyne and Macleay, orthotypic.

Heptadecacanthus Jordan, Genera of Fishes, pt. 3, 1919, p. 387. Type *Heptadecanthus longicaudis* Alleyne and Macleay.

Oblong-oval. Head deeper than long. Upper jaw not protractile. Teeth conic, biserial, outer row not prominent. Preopercle serrate. Scales 32 or 33 in a median lateral series. Dorsal spines 17, rays 15 or 16. Anal rays 16 or 17. Caudal deeply forked, lobes slender.

Distinguished by the increased spines in the vertical fins. Several nominal species have been proposed, likely synonyms of the well-known Indo-Australasian form.

ACANTHOCHROMIS POLYACANTHUS (Bleeker)

Dascyllus polyacanthus Bleeker, Nat. Tijds. Ned. Indie, vol. 9, 1855, p. vol. 57, Fische, p. 357 (Feer) 1913. Indies).

Tetradrachmum polyacanthus Bleeker, Ned. Tijds. Dierk., vol. 2, 1862, p. 274 (Amboina).

Acanthochromis polyacanthus Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 7; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 151 (Sangi, Batjan, Amboina).—Weber, Abhand. Senckenberg. Ges., vol. 34 (1), 1911, p. 17 (Kei Islands); Siboga Exp., vol. 57, 1913, p. 357 (Feer) Fische.

Homalogrystes guntheri Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 269, pl. 6, fig. 3. About 12 miles south of the New Guinea coast at Katow.

Heptadecanthus longicaudis Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1877, p. 343, pl. 15, fig. 3. Cape Grenville.

Heptadecanthus brevipinnis De Vis, Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 872. Queensland Coast.

Heptadecanthus maculosus De Vis, Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 873. Cardwell.

Abudefduf jordani Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 53, fig. 2. Shortland Island, Solomons.

Depth 1¾ to 1⅘; head 3⅕ to 3½, width 1¾ to 1⅞. Snout 3⅛ to 3¼; eye 2¾ to 3, greater than snout, 1 to 1¼ in interorbital; maxillary nearly or quite reaches eye, 3⅕ to 3⅓ in head; teeth conic, upper biserial in front with inner greatly smaller and lower uniserial; interorbital 2⅗ to 2⅔, broadly convex; infraorbital and hind preopercle edge finely serrate. Gill-rakers 8+17, lanceolate, rather long and slender.

Tubes in lateral line 19 to 21, pores in straight section 13 to 15+1 or 2; 4 or 5 scales above lateral line to spinous dorsal origin, 12 or 13 below, 28 to 30 predorsal forward to nostrils; 4 rows of cheek scales; infraorbitals largely naked. Scales with 9 or 10 basal radiating striae; apical denticles 65 to 75 with 4 or 5 transverse series of basal elements; circuli very fine.

D. XVII, 15, 1 or 16, 1, seventeenth spine 1¼ to 1⅗ in head, fourth ray 3⅕ to 3¼, sometimes first ray simple; A. II, 16, 1 or 17, 1, second spine 1⅗ to 1¾, sixth ray 3⅙ to 3¾ in combined head and body, sometimes first ray simple; caudal 2 to 2¼, sharply forked; pectoral 2½ to 2⅗; ventral 2⅖ to 2⅗; least depth of caudal peduncle 1⅞ to 2 in head.

Dusky to chestnut brown generally, scarcely lighter below. Body, usually, head also, more or less variably blotched or mottled with neutral dusky, less so over under surface of head, breast, and abdomen. Some examples show fewer mottlings, or may even be largely uniform. Others often have rows of dark or blackish dots as parallel lines along sides of abdomen. Some small examples with minute, obscure, blue gray dots about bases of anal fins on tail and on caudal peduncle. Iris deep brown. Fins dusky or deeper than body color, usually obscurely with scattered mottling of darker or with spots of blackish. Small dusky spot, ill defined, at pectoral origin. Some small examples nearly uniform.

East Indies and Melanesia. We fail to find any reliable characters to distinguish the nominal species included above, as described by De Vis and Seale.

3 examples, Bolalo Bay, Palawan. December 21, 1908. Length, 77 to 115 mm.
10325 and 10327. Balikias, Lubang Island. July 17, 1908. Length, 122 to 125 mm.
3 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 80 to 100 mm.
24 examples, Candaraman Island, Balabac. January 4, 1909. Length, 79 to 110 mm.
12572. 2 examples, Caxisigan Island. January 2, 1909. Length, 122 to 127 mm.
7429 and 7430. Dalaganem Island. April 8, 1909. Length, 125 to 130 mm.
1 example, Doworra Island. December 2, 1909. Length, 122 mm.
4 examples, Endeavor Strait. December 22, 1908. Length, 103 to 115 mm.
3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 126 to 128 mm.
13080 and 13082. Kapoposang Island. December 28, 1909. 3 examples. Length, 104 to 118 mm.
14729, 14730, 14734. Kayoa Island. November 29, 1909. Length, 80 to 135 mm.
14991 and 14998. Makesi Island, Palawan. April 5, 1909. Length, 117 to 120 mm.
12348. Mansalay, Mindoro. February 20, 1909. Length, 120 mm.
11375. Maricaban Island, Luzon. January 20, 1908. Length, 125 mm.
21442. Maitara Island. November 26, 1909. Length, 64 to 120 mm. 4 examples.
1 example, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 102 mm.

12852, 12853, 12855, 14287. Pagapas Bay, Luzon. February 20, 1909. Length, 120 to 130 mm.

2 examples, Pagapas Bay. February 26, 1909. Length, 127 to 130 mm.

11410, 11412, 11416. Paluan Bay, Mindoro. December 11, 1908. Length, 125 to 140 mm.

1 example, Panpan, Tara Island. September 20, 1909. Length, 122 mm.

9 examples, Philippines. Length, 64 to 142 mm.

12 examples, Polloc, Mindanao. May 22, 1908. Length, 98 to 132 mm.

3 examples, Port Caltom. December 15, 1908. Length, 83 to 130 mm.

13096. 7 examples, Port Galera, Mindoro. June 9, 1908. Length, 65 to 140 mm.

1 example, Port Galera. October 27, 1909. Length 128 mm.

2 examples, Port Jamelo, Luzon. July 13, 1908. Length, 100 to 125 mm.

10471. 23 examples, Port Maricaban. July 21, 1908. Length, 80 to 178 mm.

1 example, Port Uson, west of Pinas Island. December 17, 1908. Length, 93 mm.

12186. Powati Harbor, Makyan Island. November 28, 1909. Length, 132 mm.

14164, 14165. Pujada Bay, East Mindoro. May 15, 1908. Length, 90 to 120 mm. 7 examples.

4 examples, Sablayan, Mindoro. December 12, 1908. Length, 100 to 115 mm.

11192. Siasi market, Siasi Island. February 17, 1908. Length, 130 mm. [116.] General color seal-brown, darkest in irregular mottlings; very little lighter below. Dorsal almost black, most nearly so at edge of spinous part and posteriorly. Caudal irregularly mottled with white and dark areas. Anal almost black. Ventrals mottled, produced ray black at tip. Pectoral dusky, group of small blacker spots on upper half near base. Iris very dark.

19208, 19210, 19211, 19216, 19209. Tapiantana Island. September 13, 1909. Length 120 to 132 mm.

6 examples, Tara Island. December 14, 1908. Length, 114 to 116 mm.

3 examples, Tara Island. December 15, 1908. Length, 100 to 123 mm.

3 examples, Tataan Island. February 2, 1908. Length, 89 to 94 mm.

7351 to 7359. Tataan Island. February 19, 1908. Length, 100 to 120 mm.

13 examples, Tataan Island. February 20, 1908. Length, 83 to 102 mm.

1 example, Tilig, Lubang. July 15, 1908. Length, 123 mm.

4 examples, Tulayan Island. September 15, 1909. Length, 124 to 125 mm.

7 examples, Tumindao Island, reefs of south lagoon. February 26, 1908. Length, 90 to 104 mm.

20335. Tutu Bay, Jolo Island, first anchorage. September 19, 1909. Length, 100 to 125 mm.

19082, 19083, 19085, 19086. Varadero Bay, Mindoro. July 23, 1908. Length, 94 to 134 mm.

1 example, Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 110 mm.

1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 58 mm.

13340, 13341, 14647. Tidore Island, south of Ternate. November 24, 1909. 6 examples. Length, 122 to 130 mm.

Genus CHROMIS Cuvier

Chromis Cuvier, Bull. Soc. Philomath. Paris, 1814, p. 68. Type *Sparus chromis* Linnaeus, monotypic (not *Chromis* Plumier 1803).

Heliases Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 494. Type *Heliases insolatus* Cuvier, designated by Jordan and Evermann, Genera of Fishes, vol. 1, 1917, p. 128.

Heliastes LOWE, Trans. Zool. Soc. London, vol. 2, 1841, p. 177. Type *Heliases insolatus* CUVIER.

Furcaria POEY, Mem. Hist. Nat. Cuba, vol. 2, 1861, p. 194. Type *Furcaria puncta* POEY, designated by JORDAN, Genera of Fishes, vol. 2, 1919, p. 299.

Ayresia COOPER, Proc. Calif. Acad. Sci., 1863, p. 73. Type *Ayresia punctipinnis* COOPER, orthotypic.

Onychognathus TROSCHEL, Arch. Naturg., 1866, p. 231. Type *Onychognathus cautus* TROSCHEL, monotypic.

Actinochromis BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. (4) 166. Type *Chromis lividus* STEINDACHNER, monotypic.

Hoplochromis FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 66. Type *Heliases caeruleus* CUVIER, orthotypic.

Oblong or oval. Premaxillaries protractile. Teeth small, conic, in narrow band or irregular series in jaws, often outer row obtuse or little enlarged. Preopercle entire or rough. Gills 3½. Branchiostegals 5. Pyloric appendages 2. Scales moderate, 27 to 30 in median lateral series. Suborbitals, maxillary and lower jaw scaled. Dorsal spines 12 to 14, rays 9 to 14, spinous part twice or thrice basal length of soft fin. Anal spines 2, rays 10 to 13. Caudal lobate, lobes often acute and end in filament.

Species numerous in tropical seas, most in the Indo-Pacific. In form very compact little fishes, often with most pleasing brilliant colors.

ANALYSIS OF THE SPECIES

a^1. Teeth in jaws not directed or flaring outward.
  b^1. Anal spines small, second but little over half length of head.
    c^1. Body scales without small basal scales.
      d^1. CHROMIS, upper and lower edges of caudal fin dusky to blackish, in contrast with rest of fin.
        e^1. Ventrals gray or whitish.
          f^1. Anterior profile of head broadly rounded, form very compact. **ternatensis.**
          f^2. Anterior profile of head more angular.
            g^1. Head without dark line behind preopercle vertically; body scales without dark edges.
              h^1. Anal without black anterior edge; size small. **amboinensis.**
              h^2. Lower front anal edge broadly black; size moderate; scales uniform ---------- **scotochilopterus.**
              h^3. Lower front anal edge broadly black; size moderate; scale edges narrowly dark ---------- **reticulatus.**
            g^2. Head with dark or blackish line along and behind preopercle edge vertically; body scales with scattered dark edges ---------- **weberi.**
        e^2. Ventrals black; size small ---------- **atripes.**
      d^2. Caudal fin uniform, without black edge above or below.
        i^1. Caudal much paler than body, contrasted.
          j^1. Anteriorly dark, or posterior half of body or only caudal yellowish-white; pectoral with large dark basal blotch ---------- **dimidiatus.**

j^2. Head with dusky line along hind preopercle edge and gill-opening; no black basal pectoral blotch. **opercularis.**

i^2. Caudal not paler or contrasted with body.

k^1. Body with several longitudinal blue lines. **lineatus.**

k^2. Body without longitudinal or horizontal lines.

l^1. Body scales not edged with narrow oblique or vertical blue lines.

m^1. Coloration dark; no black tranverse band.

n^1. A yellow longitudinal medial band, followed by yellow spot at caudal base. **desmostigma.**

n^2. Pale or yellowish blotch at bases of last dorsal rays. **elerae.**

m^2. Coloration generally light.

o^1. Black transverse band at front of tail. **retrofasciatus.**

o^2. No black transverse band. **cinerascens.**

o^3. Two longitudinal black bands. **bitaeniatus.**

l^2. Each scale of body with narrow blue line marginally. **azurelineatus.**

c^2. LEPIDOCHROMIS, new subgenus. Each scale of body with 1 to 3 small basal auxiliary scales. **lepidolepis.**

b^2. DORYCHROMIS, new subgenus. Anal spine long, second but little less than head; uniform, with dark spot at pectoral axil. **analis.**

a^2. HOPLOCHROMIS. External outwardly directed conic teeth in mandible; pale blue. **caeruleus.**

Subgenus CHROMIS Cuvier

In this group we include those species in which the jaw teeth do not flare outward, second anal spine moderate or short, and no small auxiliary basal scales to body scales.

CHROMIS TERNATENSIS (Bleeker)

Heliases ternatensis BLEEKER, Nat. Tijds. Ned. Indie, vol. 10, 1856, p. 377. Ternate.

Heliastes ternatensis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 63 (East Indies).

Chromis ternatensis BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 4; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 161 (Flores, Timor, Ternate, Buru, Obi major, Amboina, Goram, Aru, New Guinea).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 359 (Beo in Karakelang Island).

Chromis philippinus FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 63, fig. 25. Philippines.

Depth 1⅘ to 2; head 3 to 3⅖, width 1¾ to 2. Snout 3½ to 4 in head; eye 2⅖ to 2⅞, greater than snout; maxillary 2⅘ to 3⅛, reaches to or little beyond front eye edge; teeth irregularly triserial in jaws, outer row in each little enlarged, simple, conic; interorbital 2⅔ to 2⅞, convex; infraorbital not free; hind preopercle edge entire. Gill rakers 9+20, lanceolate, long.

Tubes in lateral line 14 or 15, pores in straight section 9 to 12; 3 scales above lateral line to spinous dorsal origin, 9 below, 23 predorsal; 4 rows of cheek scales. Scales with 7 to 10 basal radiating striae, apical denticles 91 to 100, with 1 to 4 transverse series of basal elements; circuli very fine.

D. XII, 10, 1 or 11, 1, third spine 2⅕ to 2⅖ in head, fourth ray 1⅛ to 1¼; A. II, 10, 1 to 12, 1, second spine 2⅛ to 2⅓, sixth ray 1½ to 1⅗; least depth of caudal peduncle 2 to 2⅛; caudal strongly forked, 2⅓ to 2⅔ in combined head and body; pectoral 3 to 3⅛; ventral 1 to 1⅛.

Above dark brown, variably deeper or dusky, below paler. Scales of back often with lighter centers. Head pale brown below. Iris dark brown. Dorsals and anals dusky or blackish brown. Caudal brownish, upper and lower borders broadly dusky to blackish. Paired fins pale brown.

East Indies, Philippines.

The obtuse head and strongly ovoid contour of this species are quite distinctive. It is one of the most compact in form of the genus, or in fact of the family. The black bordered caudal and pale paired fins will distinguish it from the related species.

1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 68 mm.

1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 74 mm.

5 examples, Balikias Bay, Lubang Island. July 17, 1908. Length, 45 to 73 mm.

1 example, Batan Island. June 5, 1909. Length, 85 mm.

12250. Batan Island. June 5, 1909. Length, 55 mm.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 72 mm.

1 example, Bulan Island, Samales Group. September 13, 1909. Length, 78 mm.

1 example, Burias Island, Alimango Bay. March 5, 1909. Length, 74 mm.

180 and 186. Busin Harbor, Burias Island. March 8, 1909. Length, 68 to 78 mm.

1 example, Busin Harbor. June 2, 1909. Length, 72 mm.

15047. Calangaman Island, between Leyte and Cebu. March 16, 1909. 2 examples. Length, 47 to 81 mm.

1 example, Candaraman, Balabac. January 4, 1909. Length, 85 mm.

1 example, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 60 mm.

1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 70 mm.

6 examples, Caracaran, Batan Island. June 8, 1909. Length, 57 to 85 mm.

7425 B. F. 3 examples, Dalaganem Island. April 8, 1909. Length, 80 to 108 mm.

4 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 70 mm.

13229. Doworra Island. December 2, 1909. Length, 51 to 82 mm. 15 examples.

2 examples Galera Bay, Mindoro. June 9, 1908. Length, 54 to 89 mm.

7 examples, Gomomo Island. December 3, 1909. Length, 48 to 89 mm.

9905. Inamucan Bay, Mindanao. August 8, 1909. Length, 70 mm.

1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 89 mm.
1 example, Isabel, Basilan. September 11, 1909. Length, 76 mm.
13081. Kapoposang Island. December 28, 1909. 3 examples. Length 90 to 110 mm.
4 examples, Labuan Blanda Island. December 14, 1909. Length, 67 to 87 mm.
5 examples, Ligpo Point, Balayan Bay. January 18, 1908. Length, 54 to 94 mm.
2 examples, Ligpo Point. January 19, 1908. Length, 63 to 74 mm.
5 examples, Limbones Cove, Luzon Island. February 8, 1909. Length, 68 to 78 mm. [1123.] Greenish, overshaded with black; below pale silvery gray; tips of dorsals and caudal blackish, other fins dusky.
13927 and 13928. Lampinigan Island. September 11, 1909. Length, 80 mm.
14821, 14822, 14825, 14827, 20920. Little Santa Cruz, Zamboanga. May 26, 1908. Length, 84 to 94 mm.
15 examples, Little Santa Cruz Bay. May 28, 1908. Length, 68 to 92 mm.
13 examples, Little Santa Cruz Island. May 28, 1908. Length, 71 to 93 mm.
1 example, Mactan Cove, Mactan Island. April 6, 1908. Length, 95 mm.
4 examples, Mactan Island, Cebu. March 25, 1909. Length, 80 to 93 mm.
1 example, Maitara Island. November 26, 1909. Length, 28 mm.
1 example, Makesi Island, Palawan. April 5, 1909. Length, 60 mm.
2 examples, Makyan Island. November 29, 1909. Length, 61 to 67 mm.
7 examples, Mansalay, Mindoro. June 4, 1908. Length, 70 to 89 mm.
24 examples, Mantacao Island, west coast Bohol. April 8, 1908. Length, 42 to 92 mm.
1 example, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length 73 mm.
3 examples, Masamat Bay, Quinalasag Island. June 12, 1909. Length, 67 to 70 mm.
4 examples, Murcielagos Bay. August 9, 1909. Length, 68 to 87 mm.
1 example, Northwest Verde Island. July 22, 1908. Length, 80 mm.
27 examples, Opol, Mindanao. August 4, 1909. Length, 60 to 78 mm.
14289 [1148], 22075, 22077 to 22079. Pagapas Bay, Luzon. February 20, 1909. Length, 88 to 98 mm.
4 examples, Pagapas Bay vicinity. June 16, 1909. Length, 79 to 82 mm.
50 examples, Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 60 to 88 mm.
4 examples, Philippines. Length, 75 to 87 mm.
6 examples, Pilas Island. September 12, 1909. Length, 68 to 80 mm.
2 examples, Polloc, Mindanao. May 22, 1908. Length, 75 to 80 mm.
7 examples, Port Banalacan, Marinduque. February 23, 1909. Length, 68 to 80 mm.
15121, 15125, 15238. Port Dupon, Leyte Island. March 17, 1909. Length, 80 to 90 mm.
1 example, Port Galera, Mindoro. June 9, 1908. Length, 92 mm.
1 example, Port Galera. October 27, 1909. Length, 90 mm.
10351. Port Jamelo, Luzon. July 13, 1908. 3 examples. Length, 80 to 88 mm.
10 examples, Port Maricaban. July 21, 1908. Length, 30 to 92 mm.
6 examples, Port Matalvi, Luzon Island. November 22, 1908.
6 examples, Port Matalvi. November 23, 1908. Length, 75 to 90 mm.
1 example, Port Palapag. June 2, 1909. Length, 79 mm.
4 examples, Port Palapag. June 3, 1909. Length, 68 to 83 mm.
1 example, Powati Harbor, Makyan Island. November 28, 1909. Length, 82 mm.
1 example, Quinalasag Island, Masamat Bay. June 12, 1909. Length, 70 mm.
22 examples, Rapu Rapu Island. June 22, 1909. Length, 60 to 81 mm.

6396. Rasa Island, Mantaquin Bay. April 1, 1909. 5 examples. Length, 55 to 74 mm.

1 example, Romblon. March 26, 1908. Length, 75 mm.

22 examples, Sablayan, Mindoro. December 12, 1908. Length, 47 to 87 mm.

1 example, Sacol Island. September 9, 1909. Length, 78 mm.

1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 55 mm.

1 example, Simaluc Island. September 22, 1909. Length, 95 mm.

1 example, Simaluc Island. September 23, 1909. Length, 102 mm.

3 examples, Singaan Island. September 21, 1909. Length, 85 to 98 mm.

3 examples, Sulade Island. September 17, 1909. Length, 55 to 79 mm.

9 examples, Surigao, Mindanao. May 8, 1908. Length, 62 to 82 mm.

28 examples, Taganak Island. January 7, 1909. Length, 50 to 87 mm.

13580 and 22850. Talisse Island. November 9, 1909. 8 examples. Length, 44 to 84 mm.

3 examples, Tanakeke Island. December 21, 1909. Length, 69 to 85 mm.

15 examples, Tapiantana Island. September 13, 1909. Length, 47 to 88 mm.

3 examples, Tara Island. December 14, 1908. Length, 57 to 68 mm.

6 examples, Tara Island. December 15, 1908. Length, 73 to 88 mm. [799.] Back slaty, with steel blue shades; lower surface paler; black edge on each caudal lobe; tips of spinous dorsal membranes blackish.

3 examples, Tataan Island, Tataan Bay, Tawi Tawi Group. February 20, 1908. Length, 67 to 70 mm. [157.] Sides olive-green; back with black shades, lower parts pearly blue. Dorsal slaty-black, center of spinous membrane blotched with gray, fading out on base of soft part; edges of caudal lobes black, in width about diameter of pupil; central part dusky. Anal, ventral and pectoral dusky. Iris silvery, with greenish shades. Hinder limb of preopercle with dusky line.

1 example, Tataan Island, Tawi Tawi Group. February 2, 1908. Length, 92 mm.

12 examples, Tilig, Lubang Island. July 14, 1908. Length, 74 to 88 mm.

1 example, Tilig, Lubang. July 15, 1908. Length, 90 mm.

3 examples, Togian Bay, Togian Island. November 19, 1909. Length, 39 to 70 mm.

3 examples, Tomahu Island. December 11, 1909. Length, 65 to 78 mm.

6154. 1 example, Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 73 mm.

2 examples, Tulnalutan Island. September 9, 1909. Length, 68 to 85 mm.

6 examples, Tulayan Island. September 15, 1909. Length, 74 to 87 mm.

4 examples, Tutu Bay, First Anchorage, Jolo Island. September 19, 1909. Length, 50 to 75 mm.

6 examples, Tifu Bay, Bouro Island. December 10, 1909. Length, 55 to 75 mm.

21331. Bira-Birahan Island, off Borneo. December 31, 1909. Length, 70 mm.

7 examples, Buka Buka Island, Tomini Gulf, Celebes. November 20, 1909. Length, 52 to 74 mm.

13692. 13696, 13698. Cape Kait, Libani Bay, Celebes. December 29, 1909. 5 examples. Length, 75 to 88 mm.

14857. Dodepo and Pasejogo Islands, Celebes. 3 examples. November 16, 1909. Length, 58 to 70 mm.

2 examples, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 68 to 82 mm.

12772. Limbe Strait, Celebes. November 10, 1909. Length, 97 mm.

2 examples, Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. Length, 58 to 90 mm.

1 example, Una Una Road. November 18, 1909. Length, 39 mm.

12 examples, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length. 65 to 68 mm.

1 example, Tidore Island, south of Ternate. November 24, 1909. Length, 70 mm.

1 example, Tidore Island. November 25, 1909. Length, 80 mm.

47541 to 47547 A.N.S.P. Philippines. Commercial Museum Philadelphia. Type and paratypes of *Chromis philippinus*. Length, 58 to 75 mm.

CHROMIS AMBOINENSIS (Bleeker)

Heliases amboinensis BLEEKER, Nat. Tijds. Dierk., vol. 4, 1873, p. 111. Amboina.

Chromis amboinensis BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 8; Nat. Verh. Holl. Maatsch, Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 162 (Amboina).

Depth 1¾ to 1⅞; head 3 to 3¼, width 1⅘ to 1⅞. Snout 3½ to 4⅓; eye 2⅖ to 3, greater than snout, 1⅕ in interorbital or greater than interorbital in young; maxillary reaches eye in young, little beyond front eye edge with age, 3⅕ to 3¼ in head; teeth conic, in several series, an outer row of enlarged ones and narrow inner band of 1 to 3 irregular series; interorbital 2½ to 3⅛ in head, broad, but little convex; infraorbital little free and like hind preopercle edge entire. Gill rakers 7+20, lanceolate, slender, rather long.

Tubes in lateral line 12 to 14, pores in straight section 7 or 8+0 or 1; 3 scales above lateral line to spinous dorsal origin, 9 below, 18 predorsal forward to snout tip; 4 rows of cheek scales, with uppermost row on infraorbitals and extend forward to completely cover preorbital. Scales with 6 or 7 basal radiating striae; apical denticles 90 to 141, with 1 to 3 transverse series of basal elements; circuli fine.

D. XII, 11, 1 or 12, 1, twelfth spine 1¾ in head, fifth ray 2½ to 3¼ in combined head and body, first ray often simple; A. II, 12, 1 or 13, 1, second spine 1⅗ to 1⅔ in head, eighth ray 2⅞ to 3½ in combined head and body, first ray often simple; caudal deeply and slenderly forked, 1⅗ to 1¾; pectoral 2½ to 2⅔; ventral 2½ to 2⅔; least depth of caudal peduncle 1⅞ to 2 in head.

Light brown generally, becoming very pale to whitish below, edges of scales very obscurely darker. Iris brownish. Infraorbital gray white. Dorsals and anals deep brown terminally, last rays of soft dorsal and soft anal abruptly whitish. Caudal with upper and lower edges broadly dusky, medianly whitish. Upper and lower edges of caudal peduncle slightly darker brown than sides. Paired fins pale brownish. Pectoral sometimes with faint brown shade or blotch basally, axil pale. Ventral dusky terminally, front edge narrowly whitish.

Only known previously from the East Indies. The materials listed below will indicate its occurrence in the Philippines. Bleeker mentions but a single example 61 mm. long.

Remarkably uniform in general color design and the structural variations slight. Our materials agree with Bleeker's figure, which is a little crude, as in every case the darker terminal area of the anal extends along posteriorly to the tips of the longest soft rays.

1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 82 mm.

13724, 13728. Alimango Bay, Burias Island. March 5, 1909. 3 examples. Length, 72 mm.

1 example, Balikias Bay, Lubang Island. July 17, 1908. Length, 78 mm.

7 examples, Basa Reef, Gulf of Boni. December 17, 1909. Length, 55 to 78 mm.

1 example, Bugsuk, Balabac. January 5, 1909. Length, 60 mm.

1 example, Burias Island, Alimango Bay. March 5, 1909. Length, 72 mm.

8 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 62 to 82 mm.

2 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 77 to 92 mm.

12 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 60 to 87 mm.

13231. Doworra Island. December 2, 1909. 29 examples. Length, 36 to 78 mm.

9 examples, Galera Bay, Mindoro. June 9, 1908. Length, 50 to 70 mm.

4 examples, Gomomo Island. December 3, 1909. Length, 61 to 90 mm.

9903. Inamucan Bay, Mindanao. August 8, 1909. 3 examples. Length, 68 to 98 mm.

1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 68 mm.

3 examples, Isabel, Basilan. September 11, 1909. Length, 80 to 98 mm.

14737. Kayoa Island. November 29, 1909. Length, 60 mm.

2 examples, Labuan Blanda Island. December 14, 1909. Length, 55 to 82 mm.

14826. Little Santa Cruz, Zamboanga. March 26, 1908. Length, 80 mm.

14818. Little Santa Cruz. May 26, 1908. Length, 77 mm.

21043. Little Santa Cruz Island. May 28, 1908. 12 examples. Length, 61 to 144 mm.

2 examples, Mabul Island. September 29, 1909. Length, 68 to 73 mm.

6 examples, Mactan Island, Cebu. March 25, 1909. Length, 70 to 82 mm.

29. Malapascua Island. March 16, 1909. Length, 63 mm.

6 examples, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 53 to 90 mm.

2 examples, Murcielagos Bay, Mindanao. August 21, 1909. Length, 66 to 74 mm.

21 examples, Opol, Mindanao. August 4, 1909. Length, 50 to 70 mm.

1 example, Pagapas Bay, Luzon. February 26, 1909. Length, 85 mm.

5 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 50 to 77 mm.

3 examples, Pandanon Island. March 23, 1909. Length, 60 to 65 mm.

1 example, Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 80 mm.

6 examples, Pasacao, Ragay Gulf. March 9, 1909. Length, 72 to 133 mm.

10 examples, Philippines. Length, 53 to 70 mm.

1 example, Polloc, Mindanao. May 22, 1908. Length, 70 mm.

6 examples, Port Banalacan, Marinduque. February 23, 1909. Length, 50 to 77 mm.

15133 and 15144. Port Dupon, Leyte Island. March 17, 1909. Length, 60 to 72 mm.

19961. Port Galera, Mindoro. October 27, 1909. 3 examples. Length, 64 to 95 mm.

2 examples, Port Palapag. June 3, 1904. Length, 58 to 65 mm.

4 examples, Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 55 to 68 mm.

5 examples, Pujada Bay, East Mindanao. May 15, 1908. Length, 68 to 85 mm.

1 example, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 54 mm.

2 examples, Rapu Rapu Island. June 22, 1909. Length, 73 to 78 mm.

11 example, Romblon Harbor. March 25, 1908. Length, 68 to 85 mm. [457 to 459.] Cadmium blotch at pectoral base and slight orange wash below; back with dusky-orange reflections.

11 examples, Romblon. March 26, 1908. Length, 60 to 80 mm.

1 example, Santa Cruz, Marinduque. April 24, 1908. Length, 83 mm.

10 examples, Sulade Island. September 17, 1909. Length, 62 to 78 mm.

2 examples, Sitanki Reef. Length, 72 to 75 mm.

3 examples, Talisse Island. November 9, 1909. Length, 60 to 67 mm.

9 examples, Tapiantana Island. September 13, 1909. Length, 52 to 78 mm.

3 examples, Tataan Island, Simaluc Island, Tawi Tawi Group. February 2, 1908. Length, 50 to 77 mm.

3 examples, Tataan, Simaluc Island. February 20, 1908. Length, 70 to 75 mm. [173 and 174.] Somewhat drab above, pearl-blue below; snout yellowish. Dorsal body-color, tipped with black and crescentic yellowish margin on vertical edge. Caudal without yellow, its edges black to width of pupil; center body-color. Anal body-color, washed with yellow at base and becomes slaty at tip. Ventrals pale, with yellowish wash. Pectoral dusky, bright orange at base and axil. Iris dusky-silvery.

1 example, Tataan Island. February 21, 1908. Length, 84 mm.

1 example, Togian Bay, Togian Island. November 19, 1909. Length, 45 mm.

20950. Tomahu Island. December 11, 1909. 2 examples. Length, 82 to 89 mm.

2 examples, Tulnalutan Island. September 9, 1909. Length, 75 to 80 mm.

20332. Tutu Bay, Jolo. September 19, 1909. 11 examples. Length, 53 to 72 mm.

19088. Varadero Bay, Mindoro. July 23, 1908. 2 examples. Length 68 to 92 mm.

2 examples, Tifu Bay, Bouro Island. December 10, 1909. Length, 60 to 82 mm.

5 examples, Uki, Bouro Island. December 9, 1909. Length, 48 to 62 mm.

14327. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length 83 mm.

12919 and 13461. Buka Buka Island, Gulf of Tomini, Celebes. November 20, 1909. Length, 41 to 60 mm.

13690, 13694 and 13697. Cape Kait, Libani Bay, Celebes. December 29, 1909. 6 examples. Length, 59 to 79 mm.

14853, 14854, 14856, 14859. Dodepo and Pasejogo Islands, Celebes. November 16, 1909. 14 examples. Length, 52 to 68 mm.

1 example, Limbe Strait, Celebes. November 10, 1909. Length, 75 mm.

7 examples, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 41 to 70 mm.

6 examples, Sadaa, Celebes. November 17, 1909. Length, 45 to 80 mm.

7 examples, Una Una Road, Gulf of Tomini, Celebes. November 18, 1909. Length, 36 to 55 mm.

2 examples, west of Malibagu Point, Gulf of Tomini, Celebes. November 21, 1909. Length, 68 mm.

6 examples, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 36 to 71 mm.

3 examples, Tidore Island, south of Ternate. November 24, 1909. Length, 61 to 74 mm.

6 examples, Tidore Island. November 25, 1909. Length, 58 to 80 mm.

CHROMIS SCOTOCHILOPTERUS Fowler

Chromis scotochilopterus Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 61, fig. 24. Philippine Islands.

Depth 1⅞ to 2¼; head 3 to 3¼, width 1⅖ to 1⅘. Snout 4 to 4⅓ in head; eye 2⅗ to 3$\frac{1}{10}$, greater than snout, 1⅕ in interorbital or little greater than interorbital in young; maxillary reaches little beyond front eye edge or to front pupil edge, 2⅖ to 2⅞ in head; teeth conic, outer series little enlarged in each jaw and inner biserial row of smaller ones above and uniserial inner row of smaller lower ones; interorbital 2⅞ to 3⅕, broadly convex; hind preopercle edge entire. Gill rakers 10+13, lanceolate, long.

Tubes in lateral line 17 to 19, pores in straight section 7 to 11+1 or 2; 3 scales above lateral line to spinous dorsal origin, 9 below, predorsal 32; 6 rows of cheek scales, two median rows enlarged. Scales with 6 to 9 basal radiating striae; apical denticles 130 to 134, with 3 to 8 transverse series of basal elements.

D. XIII, 10, 1 or 11, 1, thirteenth spine 2 to 2⅓ in head, fourth ray 1⅖ to 1½, first ray often simple; A. II, 11, 1, second spine 1⅖, first ray 1¼ to 1⅓, often simple; least depth of caudal peduncle 2 to 2⅛; caudal sharply forked, 2⅓ to 2⅞ in combined head and body; pectoral 3 to 3¼; ventral 3 to 3½.

Back deep umber to dusky, more brownish on sides and pale brown below. Iris neutral brown. Preorbital grayish. Cheeks and breast with drab tinge. Pectoral, most of soft dorsal, greater median portion of caudal and most of anal dull yellowish white. On all last fins contrast with blackish, as both upper and lower edges of caudal broadly blackish, former extending along caudal peduncle above and lower or front anal edge. Small dusky brown spot at pectoral origin, not sharply defined and sometimes inconspicuous, axil pale. Paired fins pale brownish or grayish.

Only known from the Philippines. It bears some superficial resemblance to *Chromis notatus* Schlegel, of which we have compared 11 examples, 8244 U.S.N.M. from the Riu Kiu Islands, obtained by William Stimpson, which measure 112 to 130 mm. *Chromis notatus* differs, however, strikingly in the black blotch at the pectoral base and a white blotch at the bases of the last dorsal rays.

14776. Bagacay Bay, Escarpada Island. March 13, 1909. Length, 138 to 155 mm.

2 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 119 to 123 mm.

1 example, Capulaan Bay. February 24, 1909. Length, 53 mm.

3 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 134 to 140 mm.

13999 and 14001. Gondra Island. September 20, 1909. Length, 127 to 138 mm.

9857 and 9859, 3 examples, Labuan Blanda Island. December 14, 1909. Length 125 to 146 mm. [2135.]

17836. Langao, Luzon. June 24, 1909. Length, 110 mm.

1 example, Little Santa Cruz Island. May 28, 1908. Length, 142 mm.

5 examples, Malapascua Island. March 16, 1909. Length 93 to 135 mm.

1 example, Northwest Verde Island. July 22, 1908. Length, 85 mm.

11127. Pasacao, Ragay Gulf, Luzon. March 9, 1909. Length, 140 mm. [1252.] Dusky-green on top of head and back, becoming grey below to soiled white on breast and belly; margins of scales slightly darker. Scaled portion of dorsal body-color; spinous tips above more olive; soft dorsal reddish-brown. Edges of caudal lobes with broad black stripe, this running somewhat into upper peduncle above, but stopping abruptly below; central portion of fin color of soft dorsal. Front of anal blackish, scaled portion more or less green as back; hinder portion of fin gray at base, becoming brownish distally, similar to other soft verticals. Ventrals dusky, with slight brownish shades on rays. Pectorals dusky, with slight brownish shade at base, no distinct blackish blotch but somewhat more dusky at upper base.

4 examples, Panpan, Tara Island. September 20, 1909. Length, 130 to 150 mm.

3 examples, Port Galera, Mindoro. June 9, 1908. Length, 122 to 144 mm.

3 examples, Port Galera. October 27, 1909. Length, 133 to 143 mm.

10314, 10320, 10476. Port Maricaban. July 21, 1908. Length 121 to 150 mm. 8 examples.

12185 and 13838. Powati Harbor, Makyan Island. November 28, 1909. Length, 145 to 154 mm.

11259. Refugio Island, Pasacao. March 9, 1909. Length, 148 mm.

11920. Siasi Island market. February 17, 1908. Length, 150 mm.

1 example, Simaluc Island, Bisibisi. September 22, 1909. Length, 108 mm.

2 examples, Simaluc Island. September 23, 1909. Length 132 to 140 mm.

11483 to 11490. Sulade Island. September 17, 1909. Length, 108 to 145 mm. [1941.] General-color above olive, edges of scales darker; pale to gray on lower side and dusky gray on breast and belly. Dorsal olive, membranes of soft fin becoming orange posteriorly, somewhat blackish near axil. Caudal with broad black edges, central portion pale dusky orange; front portion of caudal blackish on olive, hinder portion gray, rays dusky and last few with orange shades in membranes. Ventrals dusky, somewhat slaty in front. Pectorals dusky, membranes slightly hyaline-orange.

1 example, Tumindao Island, reefs south lagoon. February 26, 1908. Length, 69 mm.

13037 and 13038. 3 examples, Limbe Strait, Celebes. November 10, 1909. Length, 135 to 140 mm.

47539 and 47540 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Type and paratype of *Chromis scotochiloptcrus*. Length, 75 to 115 mm.

CHROMIS RETICULATUS, new species

Depth 2 to 2⅛; head 3½ to 3¾, width 1⅔ to 1⅘. Snout 3¾ to 3⅘ in head from snout tip; eye 3⅛ to 3⅓, greater than snout, 1⅕ to 1¼ in interorbital; maxillary reaches opposite front eye edge or slightly beyond, 2⅞ to 3 in head from snout tip; teeth conic, in narrow bands in jaws, with outer enlarged series and inner narrow band of 1 to 3 irregular series; interorbital 2⅔ to 2¾, broadly convex; preorbital not free; preopercle edge entire. Gill rakers 8+21, lanceolate, slender, 1⅓ in gill filaments, which 1⅗ in eye.

Scales 17 or 18 tubular in upper section of lateral line, pores in lower or straight section 8 or 9 to caudal base, often first few may be irregular or variously separated by 1 to 3 scales. Preorbital with single row of scales and 4 rows on cheek. Vertical fins all more or less finely scaled basally. Scales with 8 basal radiating striae, edge scalloped; apical denticles 160 to 171, with 12 transverse series of basal elements; circuli very fine.

D. XIII, 10, 1 or 11, 1, fourth dorsal spine 2 in total head length, third spine 1 to 1⅛; A. II, 11, 1 or 12, 1, second spine 1⅞ to 2, fourth ray 1¼ to 1⅖; least depth of caudal peduncle 1¾ to 1⅞; caudal deeply forked, slender lobes narrowly and sharply pointed, 2⅓ to 2½ in combined head and body; pectoral 2⅞ to 3$\frac{1}{10}$; ventral 3 to 3⅛.

Brown generally, but slightly paler on breast and abdomen. Each scale of body with a slightly darker narrow edge, less distinct or only on upper surface of head. Iris brownish, with narrow pale circle around pupil. Paired fins pale, uniform, or with yellowish tint. Dorsals largely dusky, only posterior margin of soft dorsal pale or whitish and rather narrowly so and in contrast. Anals similar. Caudal pale medially, upper and lower edges rather broadly dusky brown and though distinctly so not in sharp contrast with rest of fin.

Known only from the type and paratypes listed below. They are closely related to *Chromis scotochilopterus*, largely with similar general color pattern. The presence of the dark reticulated edges of the scales is different from that in any species of the genus. The dark areas on the soft dorsal and anal are far more extensive than in any specimens of *Chromis scotochilopterus* and the dark bands on the tail far less contrasted.

Type.—Cat. No. 89951, U.S.N.M.

9858 and 9860 [2136]. Labuan. December 21, 1908. Length, 135 to 155 mm. 10765 and 10766. Sipadan Island. September 28, 1909. Length, 140 to 150 mm. [2011.] 3 examples. Scales with very dark olive edge, central body blue, merging into olive on hind edges; head more dusky, snout whitish. Dorsal similar to body, becoming blackish distally, vertical edge hyaline and rays pale at tips. Caudal lobes broadly black on edges, middle of fin dusky-yellowish, rays and membranes hyaline at tips within fork, except

outer three or four. Anal similar to soft dorsal. Ventrals dusky. Pectorals dusky hyaline, with yellowish at base and in axil.

14127. Tifu Bay, Bouro Island. December 10, 1909. Length, 136 mm. Type.

(*Reticulatus*, net-like, with reference to the dark edges of the scales.)

CHROMIS WEBERI, new name

Pomacentrus anabatoides (not BLEEKER) BEAN and WEED, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 608 (Java).

Depth 2⅛ to 2⅖; head 3¼ to 3⅓, width 1¾ to 1⅞. Snout 3⅗ to 4; eye 3 to 3⅔; maxillary 2¾ to 3⅓, reaches opposite front pupil edge; upper teeth in 2 rather distinct bands, outer of single larger conic teeth and inner band irregularly biserial and smaller; lower teeth with 4 enlarged conic anterior teeth and rest small irregular biserial band; interorbital 2⅔ to 3, broadly convex. Gill rakers 9+19, lanceolate.

Tubes in lateral line 18 or 19, pores in straight section 7 to 9 to caudal base +1 more sometimes; 3 scales above lateral line to spinous dorsal origin, 6 below, 30 to 32 predorsal forward close to upper lip edge; rayed vertical fins very finely scaled. Scales with 8 to 11 basal nearly parallel marginal striae, sometimes 1 to 7 more incomplete auxiliaries; apical denticles 92 to 125, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XII or XIII, 10 or 11, fourth spine 1⅞ to 2 in head, fourth ray 1⅕ to 1½; A. II, 10 or 11, second spine 1⅔ to 2, first ray 1¼ to 1¾; least depth of caudal peduncle 1⅞ to 2⅛; caudal deeply forked, 2⅛ to 2½ in combined head and body; pectoral 3⅛ to 3¼; ventral 3⅛ to 3½.

Back olive, lower sides and under surface very light olive to olive gray. Scales on preorbitals, suborbitals, and lower side of head more or less tinged with silvery. Chin dusky, also edges of mandibular scales. Hind preopercle edge and groove of opercle along side narrowly dusky down to gill opening. Humeral region with dusky streak and continuous as dusky streak across pectoral base. Spinous dorsal olive, dusky above, also front half of soft dorsal, though greater hind portion of latter whitish. Anal similar to soft dorsal, only dusky and olive anteriorly of greater extent. With age soft dorsal and anal darker to blackish and hind margins of both fins more narrowly and more contrasted whitish. Caudal with upper and lower edges olive to dark olive, usually appearing dusky, and hind edge whitish. With age hind caudal edge more narrowly and distinctly whitish, due to submarginal blackish line. Paired fins gray brown, pectoral olive basally.

Philippines and Java.

This species is marked somewhat as *Chromis opercularis* (Günther), though is smaller, more slender, and largely olivaceous or without the contrasted pale caudal of the latter. Though somber in color, its design is suggestive about the head of *Abudefduf xanthurus*.

Type.—Cat. No. 72713, U.S.N.M.

2 examples, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length 76 to 80 mm.
1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 97 mm.
24 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 75 to 94 mm.
1 example, Busin Harbor, Burias Island. March 7, 1909. Length, 67 mm.
15044. Calangaman Island, between Leyte and Cebu. March 16, 1909. 3 examples. Length, 97 to 108 mm.
5 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 84 to 94 mm.
5912 and 5913 and 5917. B. F. Catbalogan, Samar. April 15, 1908. Length, 40 to 100 mm.
1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 112 mm.
10839. Dalaganem Island. April 8, 1909. 2 examples. Length, 95 to 105 mm.
9948. Doc Can. January 7, 1910. Length, 105 mm.
10 examples, Galera Bay, Mindoro. June 9, 1908. Length, 58 to 100 mm.
1 example, Gondra Island. September 20, 1909. Length, 108 mm.
3 examples, Grande Island Reef. January 8, 1908. Length, 93 to 104 mm.
1 example, Guntao Island. December 20, 1908. Length, 98 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 105 mm.
14736. Kayoa Island. November 29, 1909. Length, 100 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 103 mm.
1 example, Langao Point, Luzon. June 24, 1909. Length, 109 mm.
1 example, Ligpo Point, Balayan Bay. January 18, 1908. Length, 98 mm.
1 example, Malanipa Island. September 8, 1909. Length, 108 mm.
1 example, Mansalay, Mindoro. June 4, 1908. Length, 98 mm.
3 examples, Maricaban Island Luzon. January 20, 1908. Length, 91 to 97 mm.
1 example, Murcielagos Bay. August 9, 1909. Length, 100 mm.
4 examples, Northwest Verde Island. July 22, 1908. Length, 72 to 108 mm.
7 examples, Panpan, Tara Island. September 20, 1909. Length, 90 to 110 mm. Types.
2 examples, Philippines. Length, 94 to 100 mm.
1 example, Polloc, Mindanao. May 22, 1908. Length, 99 mm.
6939 and 13100. Port Galera, Mindoro. June 9, 1908. 16 examples. Length, 90 to 105 mm.
2 examples, Port Galera. October 27, 1909. Length, 79 to 100 mm.
5 examples, Port Jamelo, Luzon. July 13, 1908. Length, 98 to 105 mm.
1 example, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 98 mm.
20930. Puerta Princesa, Palawan. April 5, 1909. Length, 92 mm.
1 example, Sablayan, Mindoro. December 12, 1908. Length, 100 mm.
6 examples, Sablayan. December 13, 1908. Length, 97 to 105 mm.
19078, 19103, 19104. Silino Island. August 10, 1909. Length, 98 to 111 mm.
3 examples, Simaluc Island. September 22, 1909. Length, 85 to 110 mm.
2 examples, Sipadan Island. September 28, 1909. Length, 100 to 113 mm.
12604. Sitanki wharf. February 26, 1908. Length, 115 mm.

1 example, Sitanki Reef. September 24, 1909. Length, 100 mm.
1 example, Singaan Island. September 21, 1909. Length, 99 mm.
11491 and 11494. Sulade Island. September 17, 1909. 3 examples. Length, 96 to 102 mm.
2 examples, Taganak Island. January 7, 1909. Length, 75 to 83 mm.
1 example, Tanakeke Island. December 21, 1909. Length, 92 mm.
1 example, Tataan Island, Tawi Tawi group. February 2, 1908. Length, 107 mm.
14309. Teomabal Island. September 18, 1909. Length, 120 mm.
2 examples, Usada Island near Jolo. March 3, 1908. Length, 92 mm.
14067. Uki, Bouro Island. December 9, 1909. Length, 148 mm.
14328. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 158 mm.
1 example, Tidore Island, south of Ternate. November 24, 1909. Length, 101 mm.
72713 U.S.N.M. Java. Messrs. Bryant and Palmer. Length, 113 mm. As *Pomacentrus anabatoides.*

(For Prof. Max Weber, the distinguished zoologist of Amsterdam and author of extensive works on East Indian ichthyology.)

CHROMIS ATRIPES, new species

Depth 2 to 2⅛; head 3 to 3¼, width 1¾ to 2. Snout 3¾ to 4; eye 2⅙ to 2⅔, greater than snout or interorbital; maxillary reaches opposite front pupil edge, 2⅔ to 3 in head; teeth conic, biserial above with outer row little enlarged anteriorly and below uniserial with front teeth greatly larger than upper outer series; interorbital 2⅞ to 3 in head, broadly convex; infraorbitals not free; preopercle edge entire. Gill rakers 10+18, lanceolate, slender, long.

Tubes in lateral line 15, followed irregularly by 4 to 6 pores; pores in horizontal section 8 or 9 to caudal base and 1 to 3 more on latter; 3 scales above lateral line, 8 or 9 below, 17 to 19 predorsal which extend forward to snout tip; suborbitals with single row of scales and 3 more rows on rest of scales; mandible scaly. Scales with 8 to 13 basal radiating striae; apical denticles 104 to 130, basal elements in 1 or 2 series; circuli very fine.

D. XII, 12, 1 or 13, 1, fifth spine 1¾ to 2⅕ in head, fourth ray 1⅛ to 1⅓; A. II, 12, 1 or 13, 1, second spine 1⅔ to 1⅞, fourth ray 1⅖ to 1½; least depth of caudal peduncle 1⅞ to 2; caudal 1⅔ to 2⅖ in combined head and body, deeply forked, slender and each lobe with filament terminally; pectoral 3 to 3¼; ventral 2¾ to 2⅘; in young pectorals and ventrals shorter than head.

Brown, little paler on head below and abdomen. Eye with neutral-dusky above and below. Spinous dorsal largely blackish. Soft dorsal anteriorly black and posteriorly half of fin white in strong contrast. Spinous anal and most of soft anal, except hind margin, broadly whitish. Caudal dull brown, upper and lower lobes broadly deep or dusky brown. Pectoral pale brown, with deep dusky-brown blotch at fin origin. Ventrals black.

Type.—Cat. No. 89952, U.S.N.M.

East Indies and Philippines. The dark or blackish anal and ventrals suggest *Heliastes cinctus* Playfair.[7] That species differs, however, in its dark violet color with a transverse yellowish band from below fifth and sixth dorsal spines, 2 scales width. Playfair also says the yellowish dorsal is black edged and a black white edged ocellus at base posteriorly extends on top of the tail; caudal yellow, with brighter band near base; pectorals yellow, with small dark spot in axil.

Heliastes axillaris Bennett[8] is said to have a black axil, general color of ovate body pale blue gray and caudal and anal fins blackish blue. Its fins are: D. XIV, 14; A. II, 12.

1 example, Bulan Island, Samales Group. September 13, 1909. Length, 62 mm.

3 examples, Dalaganem Island. April 8, 1909. Length, 65 to 66 mm.

1 example, Danawan Island and Si Amil Island. September 26, 1907. Length, 61 mm.

16 examples, Danawan Island and Si Amil Island. September 27, 1907. Length, 43 to 72 mm.

9 examples, Doworra Island. December 2, 1909. Length, 43 to 65 mm.

2 examples, Galera Bay, Mindoro. June 9, 1908. Length, 40 to 70 mm.

3 examples, Gomomo Island. December 3, 1909. Length, 43 to 65 mm.

5 examples, Kayoa Island. November 29, 1909. Length, 40 to 62 mm.

2 examples, Limbones Cove. February 8, 1909. Length, 58 to 63 mm.

3 examples, Little Santa Cruz Island. May 28, 1908. Length, 53 to 68 mm.

8 examples, Mabul Island. September 29, 1909. Length, 26 to 64 mm.

7 examples, Maitara Island. March 26, 1909. Length, 47 to 62 mm.

5 examples, Matiara Island. November 26, 1909. Length, 60 to 70 mm.

2 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 52 to 65 mm.

4 examples, Philippines. Length, 49 to 75 mm.

2 examples, Polloc Mindanao. May 22, 1908. Length, 57 to 64 mm.

1 example, Port Galera, Mindoro. June 9, 1908. Length, 63 mm.

1 example Port Galera, Mindoro. October 27, 1909. Length, 77 mm.

10510. Port Maricaban. July 21, 1908. Length, 64 mm.

2 examples, Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 69 to 73 mm.

2 examples, Romblon Reef. March 26, 1909. Length, 70 mm.

17 examples, Sablayan, Mindoro. December 12, 1908. Length, 33 to 65 mm.

1 example, Simaluc Island. September 22, 1909. Length 60 mm.

19542. Singaan Island. September 21, 1909. Length, 65 mm.

1 example, Sipadan Island. September 28, 1909. Length, 68 mm.

1 example, Sitanki Reef. September 24, 1909. Length, 74 mm.

3 examples, Talisse Island. November 9, 1909. Length, 40 to 50 mm.

19220 and 21910. Tapiantana Island. September 13 1909. Length, 38 to 67 mm. [1926.] 31 examples. Very pale orange with olive-brown overshade. Dorsal dusky, except vertical portion of soft part which hyaline and of slight yellowish shade; immediately in front of this fin blackish. Anal similar to soft dorsal. Caudal dusky-orange basally, edges of lobes at base blackish, color continuing along top and bottom of peduncle, fin plain dusky at tip. Ventrals blackish. Pectorals dusky, with black spot at base.

---

[7] Proc. Zool. Soc. London, 1867, p. 864. Seychelles.

[8] Proc. Comm. Zool. Soc. London, 1831, p. 128. Mauritius.

1 example, Tataan Island, Tawi Tawi Group. February 2, 1908. Length, 64 mm.

1 example, Tataan, Simulac Island. February 20, 1908. [172.] Yellowish flesh-pink, more yellowish on back; purplish shades on breast; snout yellowish. Dorsal with body color, tipped with black; crescentic yellowish margin on vertical edge. Caudal cadmium at base; prolonged tips dusky, extended forward on upper and lower edges of caudal peduncle, fin yellowish medially. Anal slaty, black on tips and edge. Pectoral dusky-yellow at base, with darker area in upper axil. Ventral slaty. Iris pale yellow, with blackish bar.

1 example, Tinakta Island, February 22, 1908. Length, 67 mm. [D. 5160.]

1 example, Tutu Bay, First anchorage, Jolo Island. September 19, 1909. Length, 66 mm.

1 example, Tifu Bay, Bouro Island. December 10, 1909. Length, 48 mm.

4 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 57 to 66 mm.

2 examples, Buka Buka Island, Tomini Gulf, Celebes. November 20, 1909. Length, 52 to 53 mm.

2 examples, Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 52 to 57 mm.

2 examples, Sadaa, Celebes. November 17, 1909. Length, 52 to 58 mm.

1 example, Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. Length, 40 mm.

15036. Tidore Island, south of Ternate. November 24, 1909. 20 examples. Length, 38 to 66 mm.

6 examples, Tidore Island, south of Ternate. Length, 49 to 65 mm.

(*Ater*, black; *pes*, foot, homologue of the ventral fin; with reference to the black ventrals.)

CHROMIS DIMIDIATUS (Klunzinger)

Heliastes dimidiatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 529. Koseir, Red Sea.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 237, pl. 15, fig. 13 (Tahiti and Raiatea).

Gliphidodon bicolor Macleay, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 365. New Guinea.

Chromis leucurus Gilbert, Bull. U. S. Fish Comm., vol. 23, pt. 2, 1903 (1905), p. 620, pl. 77, fig. 2. Avone Channel and near Kauai, Hawaiian Islands.

Chromis iomelas Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905, p. 292. Pago Pago, Samoa.

Depth 1⅘ to 2; head 3⅛ to 3¼, width 1¾ to 1⅔. Snout 3½; eye 2⅘ to 3⅛, greater than snout, 1⅛ in interorbital; maxillary reaches ¾ or to eye, 3 to 3⅛ in head; teeth conic, outer row large and inner band in each jaw of 2 or 3 irregular series of smaller ones; interorbital 2½, broadly convex; infraorbitals partly free forward, entire; hind preopercle edge entire. Gill rakers 7+20, lanceolate, slender, long.

Tubes in lateral line 14 to 17, often followed by 5 or 6 pores, which may be irregular; pores in straight section 8 to 10+1; 3 scales above lateral line to spinous dorsal origin, 9 below, 17 to 22 predorsal; 5

rows of cheek scales, uppermost row on infraorbitals. Scales with 8 or 9 basal radiating striae; apical denticles 104 to 198, with 3 or 4 transverse series of basal elements; circuli very fine.

D. XII, 12, 1 or 13, 1, thirteenth spine 1⅘ in head, fifth ray 3¼ to 3¾ in combined head and body, first ray often simple; A. II, 12, 1 or 13, 1, second spine 1½ to 1⅞ in head, seventh ray 3⅓ to 4 in combined head and body; caudal strongly forked, 1¾ to 1⅞; pectoral 2⅘ to 3; ventral 2¾ to 2⅞; least depth of caudal peduncle, 1⅘ to 1⅞ in head.

Body deep brown, usually with chocolate tinge, not paler below. Iris brown. Most examples show blue gray band along lower eye edge on infraorbitals. Dorsals, anals, and ventrals more or less dusky to blackish. Caudal, caudal peduncle, and tail, also including corresponding portions of dorsals and anals posteriorly, yellowish white to white; this color variable in extent and sometimes only confined to caudal fin or again may comprise entire posterior half of fish. Pectoral brownish, base dusky to black, though blotch not quite large as eye.

Red Sea, East Indies, Philippines, Polynesia, Hawaii.

Readily known by the dark coloration and in the extreme variations bicolored, or with the posterior half white and the anterior half dark. Günther's figure differs in that its pectoral is not shown with a large dark basal blotch. We have examples, similar in every way, except they have the black pectoral blotch very contrasted. Some of our examples have a slight black ocellus at bases of last anal rays.

1 example, Bulan Island, Samales Group. September 13, 1909. Length, 75 mm.
1 example, Dalaganem Island. April 8, 1909. Length, 83 mm.
4 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 88 to 112 mm.
6 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 36 to 107 mm.
7 examples, Doworra Island. December 2, 1909. Length, 56 to 97 mm.
1 example, Galera Bay, Mindoro. June 9, 1908. Length, 70 mm.
1 example, Grande Island Reef. January 8, 1908. Length, 65 mm.
3 examples, Guntao Island. December 20, 1908. Length, 65 to 80 mm.
14731, 14732, 14733, 14735. Kayoa Island. November 29, 1909. 7 examples. Length, 51 to 98 mm.
10 examples, Limbones Cove, Luzon Island. February 8, 1909. Length, 68 to 88 mm. [1126.] Pale dusky-orange on top of head and anterior body, posterior portions dusky-white; bright yellow frenum; pectoral base dusky.
1 example, Little Santa Cruz Island. May 28, 1908. Length, 60 mm.
9 examples, Mabul Island. September 29, 1909. Length, 22 to 77 mm.
1 example, Maitara Island. March 26, 1909. Length, 60 mm.
2 examples, Malanipa Island. September 8, 1909. Length, 60 to 63 mm.
1 example, Northwest Verde Island. July 22, 1908. Length, 80 mm.
11 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 63 to 80 mm.
2 examples, Philippines. Length, 78 to 80 mm.
9 examples, Philippines. February 15, 1908. Length, 44 to 74 mm. (D. 5145.)

1 example, Port Galera, Mindoro. October 27, 1909. Length, 80 mm.
3 examples, Port Jamelo, Luzon. July 13, 1908. Length, 68 to 75 mm.
1 example, Port Matalvi, Luzon. November 23, 1908. Length, 68 mm.
2 examples, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 72 to 80 mm.
13843. Powati Harbor, Makyan Island. 9 examples. Length, 58 to 90 mm. November 28, 1909. [2076.] Slaty-blackish. Predorsal whitish, also few last dorsal rays. Pectoral base dusky.
21413. Quinalasag Island. June 12, 1909. Length, 58 mm.
11 examples, Sablayan, Mindoro. December 12, 1908. Length, 46 to 75 mm.
1 example, Sablayan, Mindoro. December 13, 1908. Length, 58 mm.
19165, 19166, 19169. Santo Domingo de Basco, Batan Island. November 7, 1908. Length, 63 to 88 mm.
2 examples, Simaluc Island. September 22, 1909. Length, 73 to 77 mm.
4 examples, Sipadan Island. September 28, 1909. Length, 68 to 108 mm.
1 example, Talisse Island. November 9, 1909. Length, 44 mm.
4 examples, Tapiantana Island. September 13, 1909. Length, 42 to 69 mm.
2 examples, Tara Island. December 14, 1908. Length, 59 to 66 mm.
1 example, Tataan, Tawi Tawi Group. February 20, 1918. [280.]
14479. Tomahu Island. December 12, 1909. Length, 77 mm.
2 examples, Usada Island, near Jolo. March 3, 1908. Length, 56 to 68 mm. Slaty-blue, scale edges brighter blue; posterior regions bluish white; pectoral base black, axil white.
2 examples, Tifu Bay, Bouro Island. December 10, 1909. Length, 70 to 92 mm.
2 examples, Uki, Bouro Island. December 9, 1909. Length, 73 to 75 mm.
1 example, Basa Reef, Gulf of Boni, Celebes December 17, 1909. Length 63 mm.
2 examples, Buka Buka Island, Tomini Gulf, Celebes. November 20, 1909. Length, 57 to 59 mm.
1 example, Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 68 mm.
2 examples, Limbe Straits, Celebes. November 10, 1909. Length, 70 to 75 mm.
21364. Limbe Straits, Celebes. November 11, 1909. Length, 74 mm.
6 examples, Tidore Island, south of Ternate. November 24, 1909. Length, 84 to 110 mm.
1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 62 mm.
51587 U.S.N.M. Hawaiian Islands. *Albatross* collection. Type of *Chromis leucurus*. Length, 68 mm. Compared with our series listed above, though with the white confined to caudal and tips of soft dorsal rays.
51743 U.S.N.M. Pago Pago. Bureau of Fisheries. 2 examples. Types of *Chromis iomelas*.
51182 and 51183 A.N.S.P. Pago Pago, Samoa. Capt. C. F. Silvester. Length, 60 to 75 mm.

CHROMIS OPERCULARIS (Günther)

Heliastes opercularis GÜNTHER, Fishes of Zanzibar, 1866, p. 84, pl. 4, fig. 2. Zanzibar.—BOULENGER, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).—SAUVAGE, Hist. Madagascar, Poiss., 1891, p. 435.

Depth 2 to 2⅙; head 3⅖ to 3⅘; width 1⅗ to 1⅚. Snout 4 to 4⅕; eye 3 to 3⅓; maxillary reaches little beyond front eye edge,

not quite to pupil, 2⅘ to 3; each jaw with outer series of larger conic teeth, followed by an inner biserial band of fine teeth above and a single series of fine teeth below; interorbital 3 to 3⅔, broadly convex; hind preopercle edge entire. Gill rakers 7+19, lanceolate.

Tubes in lateral line 16 or 17, pores in straight section 8+0 or 1; 4 scales above lateral line to spinous dorsal origin, 6 below, 28 predorsal forward close to upper lip; rayed vertical fins densely scaly over greater portions. Scales with 7 basal radiating striae, auxiliaries 1 to 8 incomplete; apical denticles 157 to 160, minute, basal elements in 4 to 11 transverse series; circuli very fine.

D. XIII, 11, fourth spine 1⅔ to 1⅞ in head, third ray 1 to 1⅕; A. II, 10, second spine 1¾ to 1⅞, fourth ray 1¼ to 1⅓; least depth of caudal peduncle 1⅘ to 2; caudal deeply forked, 2 to 2⅖ in combined head and trunk; pectoral 3 to 3⅛; ventral 3⅖ to 3½; anal papilla well developed.

Head and body, except posterior or greater posterior portion of caudal peduncle chocolate brown. Head with dusky line along hind preopercle edge and gill opening. Iris dark brown. Dorsals and anals dusky, hind edge of each soft lobe narrowly whitish. Paired fins brownish, little dull olive basally and base of pectoral usually with narrow dark boundary line. Anal papilla, hind portion of caudal peduncle and entire caudal fin light yellowish brown with a small dark spot medianly.

Arabian Gulf, Madagascar, Zanzibar. Not previously reported from the East Indies or Philippines.

A strongly marked species, easily distinguished by its coloration. Its pattern is like that of *Chromis dimidiatus*, but without the large dark basal pectoral blotch. The markings on the head are suggestive of *Chromis weberi*. Günther's figure does not show the tail so greatly pale in contrast with the rest of the body, as in our series of specimens. In all the small black spot medially on the caudal fin is distinct, though not conspicuous.

2 examples, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 138 mm.

1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 140 mm.

1 example, Bulan Island, Samales Group. September 13, 1909. Length, 123 mm.

7427 and 7428 B. F. Dalaganem Island. April 8, 1909. Length, 140 to 157 mm.

1 example, Danawan Island and Si Amil Island. September 26, 1909. Length, 150 mm.

2 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 140 to 145 mm.

2 examples, Doworra Island. December 2, 1909. Length, 140 mm.

15122. Dupon Port, Leyte Island. March 17, 1909. Length, 123 mm.

1 example, Galera Bay, Mindoro. June 9, 1908. Length, 127 mm.

1 example, Guntao Island. December 20, 1908. Length, 144 mm.
3 examples, Labuan Blanda Island. December 14, 1909. Length, 144 to 152 mm.
1 example, Limbones Cove. February 8, 1909. Length, 140 mm.
1 example, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 130 mm.
1 example, Maricaban Island, Luzon. January 20, 1908. Length, 110 mm.
1 example, Mompog Island. March 3, 1909. Length, 120 mm.
11346. Mompog Island. March 3, 1909. Length, 136 mm.
1 example, Murcielagos Bay, Mindoro. August 21, 1909. Length, 147 mm.
8733 and 8734; 18737 and 18738 B. F. Northwest Verde Island. July 22, 1908. Length, 112 to 160 mm.
1 example, Opol, Mindanao. August 4, 1909. Length, 145 mm.
11310. Palag Bay vicinity, Luzon. June 16, 1909. Length, 131 mm.
7 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 90 to 113 mm.
2 examples, Pasacao, Ragay Gulf, Luzon Island. March 9, 1909. Length, 150 to 157 mm. [1256.] Slaty brown; head with greenish shades, well marked on upper cheek and all of opercle; centers of scales of top of head greenish; margins of all scales, except on caudal peduncle, with darker edges; on side margin equal to nearly half of scale, basal portion greenish gray; overshaded with darker on posterior body and back, so surface altogether dark; preopercular and opercular margins black; from just behind dorsal and ventral axils caudal peduncle becomes white or grayish, which continues throughout caudal fin, though somewhat more dusky and small black blotch in center of fin between base of shortest rays; tips of last four dorsal rays hyaline and slight hyaline edge on vertical portion of anal; dorsal otherwise slaty brown and anal slaty black; ventrals nearly color of anal, rays somewhat pale; pectoral rays dusky, membranes nearly hyaline, base of fin blackish.
1 example, Philippines. Length, 150 mm.
13140 and 13141. Polloc, Mindanao. May 22, 1908. Length, 120 to 139 mm.
20673. Port Banalacan, Marinduque. February 23, 1909. Length, 143 mm.
5 examples, Port Galera, Mindoro. June 9, 1908. Length, 140 to 158 mm.
12436. Port Galera. October 27, 1909. 2 examples. Length, 150 mm.
7 examples, Port Jamelo, Luzon. July 13, 1908. Length, 122 to 139 mm.
12187. Powati Harbor, Makyan Island. November 28, 1909. Length, 148 mm.
21412. Quinalasag Island, Masamat Bay. July 12, 1909. Length, 110 mm.
19253 and 19254. Sabtan Island. November 8, 1908. Length, 138 to 152 mm.
14790, 14794. Sablayan, Mindoro. December 12, 1908. 7 examples. Length, 80 to 136 mm.
4 examples, Sablayan. December 13, 1908. Length, 118 to 130 mm.
1 example, Sacol Island. September 9, 1909. Length, 132 mm.
12675 and 12677. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 133 and 134 mm.
2 examples, Simaluc Island. September 22, 1909. Length, 140 to 148 mm.
3 examples, Simaluc Island. September 23, 1909. Length, 138 to 145 mm.
19534. Singaan Island. September 21, 1909. Length, 95 to 138 mm.
10762 and 10763. Sipadan Island. September 28, 1909. Length, 125 to 153 mm.
19219. Tapiantana Island. September 13, 1909. Length, 143 mm.
14668 and 14669. Tataan, Tawi Tawi Group. February 20, 1908. Length, 120 to 130 mm. [212, 213.] Centers of scales pale blue, margins black; on lower part of head and breast margins very narrowly dusky. Top of head almost black. Dorsal similar to adjacent body; tips of spinous membranes

jet-black with slate-blue blotches just beneath; soft dorsal jet-black except vertical edge which broadly hyaline. Caudal peduncle and caudal white, fin edged and tipped with dusky and with small black spot in center of base. Anal jet-black, vertical edge narrowly hyaline. Ventral jet-black except lower three or four rays, which bluish. Pectoral membrane hyaline, rays with black at joints. Iris blackish, with silvery shades.

3 examples, Tulnalutan Island. September 9, 1909. Length, 138 to 160 mm.

1 example, Varadero Bay, Mindoro. July 23, 1908. Length, 128 mm.

13251 and 13626. Bira Birahan Island, off Borneo. December 31, 1909. Length, 125 to 140 mm.

1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 147 mm.

12915 and 12916. Buka Buka Island, Gulf of Tomini, Celebes. November 20, 1909. Length, 132 to 138 mm.

1 example, Dodepo and Pasejogo Islands, Celebes. November 19, 1909. Length, 127 mm.

2 examples, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 120 to 122 mm.

14743. Limbe Straits, Celebes. November 10, 1909. Length, 120 mm.

13639 and 13640, 14925. Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17 and 18, 1909. Length, 104 to 153 mm. 6 examples.

CHROMIS LINEATUS, new species

Depth 2; head 3 to 3¼, width 1½ to 1⅗. Snout 4⅕ to 4½; eye 2⅔ to 2¾, greater than snout, equals interorbital, though greater in young; maxillary not quite reaching eye, though little beyond front eye edge in young; length 2⅘ to 3 in head; teeth uniserial, conic, compressed; interorbital 2⅖ to 2½ in head, broadly convex; infraorbitals and preopercles not free; hind preopercle edge entire. Gill rakers 6+17, slender, lanceolate, long.

Tubes in lateral line 14 or 15, followed by 4 or 5 irregular pores; pores in straight section 10 or 11 to caudal base; 2 scales above lateral line to spinous dorsal origin, 8 or 9 below, 16 or 17 predorsal forward to snout tip; preorbital and infraorbitals closely scaled so that 4 rows on cheek from lower eye edge. Scales with 7 or 8 basal radiating striae, edge scalloped; apical denticles 78 to 94, very small, basal elements 0 to 2 series transversely.

D. XII, 11, 1, fifth spine 1⅘ to 2 in head, sixth ray 1⅓ to 1½; A. II, 11 1, second spine 2⅛ to 2¾, first ray 1¾ to 1⅞; caudal strongly forked, pointed lobes ending in short filaments, 2⅖ to 2⅗ in combined head and body; least depth of caudal peduncle 1⅞ to 2 in head; pectoral 1⅛; ventral 1 to 1⅛.

Upper surfaces of head and body brown, little paler and with soiled appearance on head below, breast, and abdomen. Side of body with about 11 grayish longitudinal bands, not quite wide as pupil and each bordered with brown line. Head with grayish spots and blotches bordered with brown lines. Iris dusky brown, with

narrow golden circle around pupil. Vertical fins all deep brown, spinous dorsal dusky, and anal dark. Other fins all paler.

Known only from the examples listed below. Readily known by its unique banded longitudinal color pattern, the bluish bands edged with darker.

Type.—Cat. No. 89953, U.S.N.M.

1 example. Pangasinan Island. February 13, 1908. Length, 53 mm. Type.
1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 40 mm. Paratype.

(*Lineatus*, with lines.)

CHROMIS DESMOSTIGMA, new species

Depth 2 to $2\frac{1}{10}$; head $2\frac{7}{8}$ to 3, width 2. Snout $3\frac{2}{3}$ to $3\frac{4}{5}$ in head measured from upper jaw tip; eye $2\frac{2}{3}$ to 3, greater than snout or interorbital; maxillary reaches eye or slightly beyond front eye edge, $3\frac{1}{8}$ to $3\frac{1}{5}$ in head; teeth minute, small, simple, conic, uniserial; interorbital $2\frac{4}{5}$ to 3, slightly convex; preorbital, infraorbital, and preopercle edges free and entire. Gill rakers 8+16, lanceolate, slender, rather long.

Tubes in lateral line 21; pores 10 to 12 in straight section of lateral line; 5 scales above lateral line, 12 below, 22 predorsal forward to front eye edge; 3 rows of scales on cheek, none on preorbital or infraorbitals or preopercle flange; preopercle ridge distinct. Scales with 8 basal radiating striae; apical denticles 34 to 36, very small, in 2 or 3 transverse series; circuli fine.

D. XIV, 14, fourth spine $2\frac{1}{5}$ to $2\frac{1}{3}$ in total head length, fifth ray $1\frac{1}{2}$ to $1\frac{2}{3}$; A. II, 14 or 15, second spine $1\frac{2}{3}$ to 2, fifth ray $1\frac{2}{3}$ to $1\frac{4}{5}$; caudal 1 to $1\frac{1}{5}$, rather deeply forked, lobes pointed; least depth of caudal peduncle $2\frac{1}{6}$ to $2\frac{2}{5}$; pectoral 1 to $1\frac{1}{8}$; ventral $1\frac{1}{3}$ to $1\frac{2}{5}$.

Deep brown generally, slightly paler on lower surface of head, breast and belly. Iris golden to deep brown. Distinct pale brown band from close below beginning of lateral line back to beginning of caudal peduncle above, about one scale in width. Following at caudal base slightly wider pale brownish spot, its length extent of 4 scales. Spinous dorsal dusky, soft dorsal pale, with rays slightly dusky. Lower front of anal dusky, rest of fin paler with rays slightly dusky. Caudal dusky above and below dusky, medianly pale like soft dorsal and anal. Paired fins pale, anterior ventral rays little deeper brown. Pectoral axil pale.

An interesting little fish, with color pattern totally unlike that of any pomacentrid. The pale longitudinal band back on the tail followed by a blotch of the same color on the caudal base, the marks greatly contrasted.

Type.—Cat. No. 89954, U.S.N.M.

6 examples, Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 32 to 37 mm. [278, 259.] Type and 5 paratypes. Olive-green on upper sides and back, becoming slaty-blue on peduncle; top of head blackish; breast dusky, with blue reflections; an ochraceous line beginning in front of lateral line, passing under it and slightly downward, after an interruption ending as blotch on base of dorsal.

2 examples, Caxisigan, Id. January 2, 1909. Length, 32 and 33 mm. [6865.]

(Δεσμὸς, band; στίγμα, spot; with reference to the light color-pattern.)

CHROMIS ELERAE, new species

Depth 1⅞ to 2⅛; head 3⅛ to 3⅕, width 1⅔ to 2. Snout 4 to 4¼; eye 2⅖ to 2⅔, greater than snout or interorbital; maxillary reaches little beyond front eye edge though not quite to pupil, 2¾ to 2⅞ in head; teeth biserial, conic, simple, pointed, anterior outer larger; interorbital 2⅗ to 3, convex, broad; preorbital and infraorbital edges entire, not free; hind preopercle edge with few small denticles, largest toward angle. Gill rakers 12+21, lanceolate, slender, long.

Tubes in upper section of lateral line 16, followed by 5 or 6 irregular pores; pores in straight section 8 to 10 to caudal base and 1 to 3 more on latter; 3 scales above lateral line, 9 below, 18 to 20 predorsal forward till midway between nostrils; 4 rows of scales on cheek, uppermost row on preorbital and infraorbitals. Scales with 8 or 9 basal radiating striae, edge scalloped; apical denticles 82 to 97, with a single row of basal elements; circuli very fine.

D. XII, 11, 1, fifth spine 1⅔ to 1⅘ in head, fifth ray 1⅕ to 1⅓; A. II, 10, 1, second spine 1⅓ to 1⅖, fifth ray 1⅛ to 1¼; caudal forked moderately, lobes pointed, 1 to 1⅛; least depth of caudal peduncle 2 to 2$\frac{1}{10}$; pectoral 1 to 1⅛; ventral 3 to 3⅛ in combined head and body.

Back and upper surfaces vandyke-brown, paler on lower surface of head, breast, and belly. Iris dusky brown. Spinous dorsal and anal, also front half of soft dorsal and anal dusky or blackish-brown, leaving posterior halves of soft fins white in strong contrast, while bases of soft rays in whitish area yellowish-buff. Other fins all dull brownish. Pectoral origin with only very small deep brown spot, little contrasted.

Known only from the specimens listed below, the type and paratypes. The species is well marked with the contrasted dorsal and anal fins, especially the yellowish bases of the last rays.

Type.—Cat. No. 89955, U.S.N.M.

1 example, Biri Channel. June 1, 1909. Length, 48 mm.

1 example, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 47 mm.

2 examples, Pasacao, Ragay Gulf. March 9, 1909. Length, 52 to 60 mm. Type. [1255.]

4 examples, Powati Harbor, Makyan Island. November 28, 1909. Length, 43 to 62 mm.
6 examples, Sablayan, Mindoro. December 12, 1905. Length, 57 to 84 mm.
3 examples, Tulayan Island. September 15, 1909. Length, 73 to 76 mm.

(For Castro de Elera, author of the "Catalago sistemático de toda la fauna de Filipinas.")

CHROMIS RETROFASCIATUS Weber

Chromis retrofasciatus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 359, pl. 6, fig. 5. Kur Island.

Depth 1¾ to 1⅘; head 3 to 3⅖, width 1½ to 1⅔. Snout 4 to 4⅕; eye 2⅕ to 2½, twice snout length, equals interorbital; maxillary reaches eye, 3⅓ to 3½ in head; teeth conic, uniserial, anterior little larger; interorbital 2⅓ to 2⅗, broad, but little convex; preopercle edge entire. Gill rakers 7+12, lanceolate, slender, long.

Tubes in lateral line 12 or 13, often followed, sometimes irregularly, by 6 to 8 pores, pores in straight section 8 to 10+1; 3 scales above lateral line to spinous dorsal origin, 8 below, 16 predorsal; 4 rows of cheek scales, uppermost row covering infraorbitals. Scales with 6 or 7 basal radiating striae; apical denticles 80 to 89, with 1 or 2 transverse series of basal elements; circuli very fine.

D. XII, 11, 1 or 12, 1, fourth spine 1⅔ to 2 in head, sixth ray 1⅗; A. II, 12, 1, second spine 1⅓ to 1½, first ray 1⅛ to 1⅓; least depth of caudal peduncle 2 to 2⅛; caudal forked, 2⅓ to 2⅗ in combined head and body; pectoral 2¾ to 3⅓; ventral 2½ to 2¾.

Body pale to deep brown, little paler below. Iris brown. Broad black band from last dorsal spines and front half of soft dorsal, including part of tail and front of caudal peduncle to extend over anal medially. Hind or terminal portion of soft dorsal and hind margin of anal, broadly whitish, also rest of caudal peduncle and caudal fin. Spinous dorsal rather dark brown. Pectoral brown. Ventral dusky over greater anterior portion, inner or hind portion whitish. Most examples with bluish line along infraorbital border of eye.

Previously only known from the East Indies at Kur Island. A very trim little fish, the smallest species of the genus. It somewhat suggests *Abudefduf dickii*, though of greatly smaller size and the very contrasted black vertical band more posterior.

1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 43 mm.
1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 37 mm.
1 example, Balikias Bay, Lubang Island. July 17, 1908. Length, 44 mm.
9843. Cagayan. January 8, 1909. Length, 28 to 30 mm. 2 examples.
1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 41 mm.
3 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 33 to 47 mm.

3 examples Caracaran, Batan Island. June 8, 1909. Length, 34 to 40 mm.
9 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 30 to 44 mm.
1 example, Doworra Island. December 2, 1909. Length, 35 mm.
2 examples, Mabul Island. September 29, 1909. Length, 33 to 36 mm.
1 example, Mansalay, Mindoro. June 4, 1908. Length, 44 mm.
2 examples, Mantacao Island, west coast Bohol. April 8, 1908. Length, 44 to 47 mm.
3 examples, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 31 to 37 mm.
3 examples, Opol, Mindanao. August 4, 1909. Length, 29 to 40 mm.
20782. Powati Harbor, Makyan Island. November 28, 1909. Length, 44 mm.
3 examples, Polloc, Mindanao. May 22, 1908. Length, 36 to 41 mm.
2 examples, Port Banalacan, Marinduque. February 23, 1909. Length, 35 to 42 mm.
2 examples, Port Dupon, Leyte Island. March 14, 1909. Length, 35 to 40 mm.
22421. Port Dupon. March 17, 1909. Length, 42 mm.
19962. 2 examples, Port Galera, Mindoro. October 27, 1909. Length 40 to 45 mm.
1 example, Port Palapag. June 3, 1909. Length, 40 mm.
1 example, Rapu Rapu Island. June 22, 1909. Length, 43 mm.
1 example, Romblon Harbor. March 25, 1908. Length, 40 mm.
1 example, Romblon Reef. March 26, 1909. Length, 40 mm.
4 examples, Sablayan, Mindoro. December 12, 1908. Length, 30 to 37 mm.
14052 to 14054. Sacol Island. September 9, 1909. Length, 44 to 47 mm.
1 example, Tulnalutan Island. September 9, 1909. Length, 42 mm.
4 examples, Talisse Island. November 9, 1909. Length, 35 to 44 mm.
2 examples, Tapiantana Island. September 13, 1909. Length, 43 to 45 mm.
1 example, Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 41 mm. [281.]
14638. Buka Buka Island, Tomini Gulf, Celebes. November 20, 1909. 3 examples. Length, 31 to 35 mm.
13691. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 44 mm.
1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 37 mm.
3 examples, Limbe Strait, Celebes. November 10, 1909. Length, 43 to 46 mm.
2 examples, Sadaa, Celebes. November 17, 1909. Length, 36 to 38 mm.
1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 39 mm.

CHROMIS CINERASCENS (Cuvier)

Heliases cinerascens Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 495. Java.—Schlegel and Müller, Nat. Ges. Nederl. Zool., 1839–44, p. 24, pl. 6, fig. 5 (Sunda Sea).—Bleeker, Ned. Tijds. Dierk., vol. 4, 1874, p. 117 (China); Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 1; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 155 (Java, Duizend Islands, Celebes, Timor, Ceram).

Heliastes cinerascens Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 61 (Molucca Sea).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 548 (C. de Cebu).

Chromis cinerascens Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, June 10, 1904, p. 533 (Padang, Sumatra).

Glyphisodon angulatus Bleeker, Nat. Gen. Arch. Ned. Ind., vol. 2, 1845, p. 523. Batavia, Java.

Chromis insulindicus BLEEKER, Verslag. Kon. Akad. Wet. Amsterdam, ser. 2, vol. 10, 1876, p. 390. Amboina.—BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 3; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 154 (Amboina).

Glyphisodon javanicus (VAN HASSELT) BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 156 (name in synonymy).

Depth 2⅛ to 2⅖; head 3⅖ to 3¼, width 1¾ to 2. Snout 3⅔ to 4⅕; eye 2¾ to 3, greater than snout, 1⅛ in snout, greater than interorbital in young; maxillary reaches opposite front pupil edge, 2⅔ to 2⅘ in head; teeth conic, outer slightly enlarged row and inner irregular biserial row of small ones; interorbital 2⅘ to 3 in head, broadly convex; hind preopercle edge entire. Gill rakers 8+22, lanceolate, slender, rather long.

Tubes in lateral line 18 or 19, pores in straight section 7 or 8+1 to 3; 3 scales above lateral line to spinous dorsal origin, 9 below, 34 predorsal forward to snout end; 5 rows of cheek scales; infraorbital not free. Scales with 8 to 10 basal radiating striae, sometimes with 1 to 3 auxiliaries; apical denticles 86 to 122, basal elements in 4 transverse series; circuli very fine.

D. XIII, rarely XIV, 11, 1, fifth ray 1⅗ to 1¾ in head, first ray usually simple; A. II, 11, 1, second spine 1⅓ to 1⅗, first ray 1⅖ to 1½; caudal sharply forked, 1⅓ to 1⅖ in combined head and body; pectoral 3 to 3¼; ventral 2⅞ to 3¼; least depth of caudal peduncle 2 to 2⅛ in head.

Deep umber to chocolate brown, below paler, sometimes with whitish about breast and belly, though most examples with lower regions more or less swarthy. Iris brown. Many young examples paler or more light brown and with silvery reflections on lower sides of head, breast, and abdomen. Fins brown. Upper and lower caudal edges slightly deeper brown in young, not evident in larger examples. Paired fins paler and obscure small brown spot at pectoral axil, not evident in most adults.

East Indian region.

Occasionally we find an example with 14 dorsal spines. These represent *Chromis insulindicus* Bleeker, which differs in no other way from *Chromis cinerascens*. Bleeker had but a single example, the type of his *Chromis insulindicus*. The variation of our series of *Chromis cinerascens* exceed the variant he attempted to establish as *Chromis insulindicus*.

2 examples, Buang Island, Talajit Island. March 15, 1909. Length, 120 to 129 mm.

181 to 185, 302 to 304, 315. Busin Harbor, Burias Island. March 8, 1909. 11 examples. Length, 90 to 118 mm.

26 examples, Butauanan Island. June 13, 1909. Length, 46 to 100 mm.

3 examples, Canmahala Bay. March 11, 1909. Length, 89 to 105 mm.

12743. Capulaan Bay, Pagbilao, Chica Island. February 24, 1909. 2 examples. Length, 50 to 98 mm.

12986. Catbalogan, Samar. January 20, 1908. Length, 102 mm.
13008. Catbalogan. April 15, 1908. Length, 97 mm.
15 examples, Catbalogan. April 16, 1908. Length, 65 to 100 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 127 mm.
25 examples, Nabatas Point, Samar. July 24, 1909. Length, 48 to 78 mm.
11419. Paluan Bay, Mindoro. December 11, 1908. Length, 108 mm.
1 example, Pasacao, Ragay Gulf. March 9, 1909. Length, 75 mm.
6 examples, Port Jamelo, Luzon. July 13, 1908. Length, 118 mm.
1 example, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 99 mm.
10429. Verde Island on east side. July 22, 1908. Length, 100 mm.
27672. A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 104 mm.

CHROMIS BITAENIATUS, new species

Depth 2⅛; head 3, width 2⅛. Snout 4; eye 2⅔, much greater than snout or interorbital; maxillary small, reaches eye, 3 in head: teeth minute, simple, conic, in narrow band or irregularly biserial in jaws; interorbital 3⅙, but slightly convex; preorbital, infraorbital and preopercle edges entire, free. Gill rakers 5+16, lanceolate, slender, rather long.

Tubes in lateral line 16, followed by 3 or 4 irregular pores; pores in straight section 8 to caudal base; 4 scales above lateral line, 9 below, 20 predorsal scales forward nearly to snout tip; cheek with 4 rows of scales, of which uppermost on infraorbital from preorbital. Scales with 8 basal radiating striae and 67 small apical denticles, with basal elements in 1 or 2 series; circuli fine.

D. XIII, 13, 1, thirteenth spine 1⅞ in head, fifth ray 1⅖; A. II. 12, 1, second spine 2, fifth ray 1⅕; caudal deeply forked, lobes pointed, rather slender, 2½ in combined head and body; least depth of caudal peduncle 2 in head; pectoral 2⅞ in combined head and body; ventral 2¾.

Body very pale or buff to cream-buff or pinkish-buff. Deep blackish-brown band from near upper side of snout, above eye, and then horizontally back to bases of last dorsal rays and out over their full extent. Another similar and little broader band from hind eye edge back to and out over median caudal rays. Lower band also passes narrowly over iris.

Known only from the type. The species is remarkable for the longitudinal banded color pattern, unique in the family and recalling certain of the Cheilodipterids.

Type.—Cat. No. 89956, U.S.N.M.

15990. Maricaban Island, reef. January 20, 1908. Length, 45 mm. [19.] Type. Bright lemon-yellow; two black longitudinal stripes about breadth of eye. Dorsal and anal very narrowly black edged, body of fin merging into bright orange-chrome. Caudal the same, except central portion which is black from median stripe. Ventral orange-chrome. Pectoral very pale dusky, with black spot at upper edge of base.

(*Bis*, twice; *taenia*, band; with reference to the color pattern.)

CHROMIS AZURELINEATUS, new species

Depth 1⅔ to 1¾; head 2⅘ to 3⅓, width 1⅔ to 1¾. Snout 3¼ to 4; eye 2⅓ to 2⅞, greater than snout, 1 to 1¼ in interorbital; maxillary reaches eye in young, not quite to eye though little beyond nostril in adult, 3 to 3¼ in head; teeth uniserial, compressed, anteriorly largest and each with slight median notch, laterals truncate; interorbital 2⅖ to 2½ in head, broadly convex; infraorbital and preorbital edges entire, free; hind preopercle edge entire. Gill rakers 8+17, lanceolate, slender, long.

Tubes in lateral line 13 or 14, followed more or less irregularly by 5 to 7 pores; pores 12 or 13 in straight section to caudal base and 1 or 2 more on latter; 3 scales above lateral line, 11 below, 23 or 24 predorsal, but not forward quite to nostrils; preorbital and infraorbitals naked, with 3 rows of scales on cheek, of which lowest row on preopercle flange; mandible scaly.

D. XIV, 14, 1, fourteenth spine 1⅔ to 1¾ in head, fifth ray 1⅛ to 1¼; A. II, 15, 1, second spine 1⅗ to 1⅔, sixth ray 1 to 1⅛; caudal 2⅖ to 2½ in combined head and body, deeply forked, lobes slenderly pointed and end in filament; pectoral 2⅞; ventral 2⅞ to 3; least depth of caudal peduncle 1⅞ to 2 in head.

Brownish generally, little paler on under surface of head, breast, and belly. Each scale on body with median vertical pale blue or blue-gray curved line, parallel with scale edge and so arranged as to produce oblique parallel lines over most all of side of body. Scales at bases of vertical fins each with small blue-gray spot. Scales on side of head with few light blue lines. Iris light brown, golden narrow ring around pupil. Vertical fins all pale brown, with preservation some examples showing upper and lower borders of caudal broadly dusky, whereas ordinarily slightly deeper brown. Pectorals pale, ventrals little more brownish terminally.

Known only from the Philippines. A very handsome species, unique in its color pattern of oblique blue lines on the side of the body. The vertical fins and back often become much more dusky or dark in formalin specimens.

Type.—Cat. No. 89957, U.S.N.M.

5 examples, Candaraman Island, Balabac. January 4, 1909. Length, 50 to 62 mm.

50 examples, Port Uson, west of Pinas Island. December 17, 1908. Length, 30 to 60 mm. [920.] Type. Bright green with chrome shades; almost white below with green overshades. Terminal portion of dorsal with broad black bar, forming point on second or third soft ray; spines slightly lilac and pale below; soft fins pale, caudal pale, with broad black edges to lobes. Anal similar to soft dorsal; spines and membranes black terminally. Paired fins dusky.

17 examples, Tara Island. December 15, 1908. Length, 38 to 90 mm. [803.] Pale green, palest below and posteriorly. Dorsal spines bright orange, color carried somewhat into membranes in another portion of fin. Obscure dusky lines on scale rows of side.

(*Azura*, azure; *lineatus*, lined; with reference to the blue lines on the sides of the body.)

LEPIDOCHROMIS, new subgenus

Type.—Chromis lepidolepis Bleeker.

Each body scale with several small auxiliary basal scales.

(Λεπὶς, scale; *Chromis;* with reference to the auxiliary basal scales.)

CHROMIS LEPIDOLEPIS Bleeker

Chromis lepidolepis BLEEKER, Verslag. Kon. Akad. Wet. Amsterdam, ser. 2, vol. 10, 1876, p. 389. Timor; Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 2; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 154 (Timor).

Depth 2; head 3⅛ to 3¼, width 1¾ to 1⅘. Snout 4 to 4⅓; eye 2¼ to 2¾, greater than snout or interorbital; maxillary reaches pupil, 2¾ to 3 in head; teeth biserial, outer row enlarged, especially in front of jaws; interorbital 2⅔ to 3 in head, broadly convex; hind preopercle edge minutely serrated. Gill rakers 11+22, lanceolate, slender, rather long.

Tubes in lateral line 17, followed irregularly with 4 or 5 pores; horizontal section with 5 to 7 pores to caudal base and 1 or 2 more on latter; 3 scales above lateral line, 9 below, 20 to 23 predorsal which extend forward only opposite to nostril; infraorbital and preorbital scaly, 4 rows on cheek with uppermost row on infraorbitals, edge of which not free. Each scale on body with about 3 basal auxiliary scales, median largest. Scales with 6 or 7 basal radiating striae; apical denticles 117 to 126, small basal elements in 2 or 3 transverse series; circuli very fine.

D. XII, 11,1 or 12,1, fifth spine 1⅘ to 2 in head, fifth ray 1¼ to 1⅖; A. II, 11,1, second spine 1⅓ to 1½, third anal ray 1⅕ to 1¼; least depth of caudal peduncle 2; caudal 2⅔ to 2¾ in combined head and body, deeply forked, lobes sharply pointed; pectoral 1 to 1⅛ in head; ventral 1 to 1⅛.

Brown generally, with drab-gray to ecru-drab tints on sides, very pale to whitish on under surface of head and abdomen. Iris yellowish-brown. Mandible pale like under surface of head. Fins all dull brown, spinous dorsal and front of soft anal little deeper. Upper and lower edges of caudal broadly deep brown. Pectorals pale. Ventrals little deeper brown at tips.

East Indian region. Not previously reported from the Philippines. It is a dull-colored species, but known by the presence of

one or more small auxiliary scales at the bases of the larger ones, though much less developed or absent in small or young examples.

1 example, Biri Channel. June 1, 1909. Length, 73 mm.
1 example, Bulan Island, Samales Group. September 13, 1909. Length, 57 mm.
2 examples, Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 38 to 78 mm.
1 example, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 65 mm.
10841. Dalaganem Island. April 8, 1909. 2 exmples. Length, 68 to 70 mm.
1 example, Danawan Island and Si Amil Island. September 26, 1909. Length, 65 mm.
10423 and 10432. East side of Verde Island. July 22, 1908. Length 55 to 60 mm.
86, 100, 104. Endeavor Strait. December 23, 1908. Length, 48 to 56 mm.
9904 and 11094. Inamucan Bay, Mindanao. August 8, 1909. Length 62 to 68 mm.
2 examples, Langao Point, Luzon. June 24, 1909. Length, 70 to 72 mm.
14816. Little Santa Cruz, Zamboanga. May 26, 1908. Length, 67 mm.
6 examples, Makyan Island. November 29, 1909. Length, 51 to 53 mm.
4 examples, Malanipa Island. September 8, 1909. Length, 51 to 66 mm.
27. Malapascua. March 16, 1909. Length, 64 mm.
1 example, Mompog Island. March 3, 1909. Length, 70 mm.
1 example, Maitara Island. March 26, 1909. Length, 53 mm.
1 example, Maitara Island. November 26, 1909. Length, 61 mm.
1 example, Murcielagos Bay. August 9, 1909. Length, 65 mm.
1 example, Northwest Verde Island. July 22, 1908. Length, 60 mm.
1 example, Pangasinan Island. February 13, 1908. Length, 64 mm.
2 examples, Panpan, Tara Island. September 20, 1909. Length, 73 to 78 mm.
3 examples, Polloc, Mindanao. May 22, 1908. Length, 26 to 85 mm.
1 example, Port Caltom. December 15, 1908. Length, 58 mm.
1 example, Port Galera, Mindoro. June 9, 1908. Length, 70 mm.
10352. Port Jamelo, Luzon. July 13, 1908. 2 examples. Length, 38 to 61 mm.
10509. Port Maricaban. July 21, 1908. 2 examples. Length, 40 to 43 mm.
1 example, Port Palapag. June 3, 1909. Length, 54 mm.
3 examples, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 57 to 70 mm.
19255. Sabtan Island. November 8, 1908. Length, 72 mm.
1 example, Sablayan, Mindoro. December 13, 1908. Length, 40 mm.
14755. San Januico Strait, Leyte Island. April 13, 1908. Length, 55 mm.
19162, 19164, 19167, 19168. Santo Domingo de Basco, Batan Island. November 7, 1908. Length, 68 to 93 mm.
2 examples, Simaluc, Bisibisi. September 23, 1909. Length, 57 or 58 mm.
1 example, Singaan Island. September 21, 1909. Length, 72 mm.
6 examples, Tapiantana Island. September 13, 1909. Length, 32 to 60 mm.
14676. Tataan, Tawi Tawi Group. February 20, 1908. Length, 70 mm. [235.] Purplish olive; edges of scales narrowly darker. Dorsal black toward tip; caudal dusky hyaline in crotch, lobes edged dark, becoming black at tip; anal body-color, terminal third nearly black; ventral and pectoral dusky, with no marked axillary blotch.
2 examples, Tomahu Island. December 11, 1909. Length, 50 to 53 mm.
44. Tulnalutan Island. September 9, 1909. 12 examples. Length, 45 to 58 mm.
21395. Amboina Port. December 6, 1909. Length, 78 mm.
1 example, Tifu Bay, Bouro Island. December 10, 1909. Length, 45 mm.

1 example, Uki, Bouro Island. December 9, 1909. Length, 56 mm.

14639. Buka Buka Island, Tomini Gulf, Celebes. November 20, 1909. 2 examples. Length, 44 to 57 mm.

12776. Limbe Strait, Celebes. November 10, 1909. 7 examples. Length, 30 to 65 mm.

11174. Nan Wan Bay, South Formosa. January 25, 1910. Length, 86 mm.

DORYCHROMIS, new subgenus

Type.—Heliases analis CUVIER.

Distinguished by the long second anal spine, but little shorter than the head.

(Δορυ, lance; *Chromis;* with reference to the second anal spine.)

CHROMIS ANALIS (Cuvier)

Heliases analis CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 496. Amboina.—BLEEKER, Nat. Tijds. Dierk., vol. 4, 1874, p. 117 (China).

Heliastes analis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 62 (Amboyna).

Chromis analis BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 405 (6), fig. 1; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 156 (Buru and Amboina).

Heliases macrochir BLEEKER, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 346. Amboina.

Depth 1⅘ to 1⅞; head 3 to 3⅛, width 1¾ to 1⅞. Snout 3¾ to 4⅛; eye 2⅔ to 2⅘, greater than snout or interorbital; maxillary reaches little beyond front eye edge, to front pupil edge in adult, 3 to 3⅙ in head; teeth conic, biserial, inner row smaller; interorbital 3, broad, scarcely elevated; infraorbital extremely narrow, edge entire; preopercle edge entire. Gill rakers 7+20, lanceolate, slender, rather short.

Tubes in lateral line 16, pores in straight section 8 to 10+2; 3 scales above lateral line to spinous dorsal origin, 9 below, 27 predorsal well forward of nostril but not quite to snout edge; 5 or 6 rows of cheek scales, compact, uppermost narrowly on infraorbital and extended forward entirely over preorbital to nostril. Scales with 9 or 10 basal radiating striae, 0 to 3 auxiliaries; apical denticles 140 or 141, with 5 to 9 transverse series of basal elements.

D. XIII, 12, I, fifth spine 1½ to 1⅞ in head, fourth ray 1⅓ to 1⅖, first ray often simple; A. II, 11, I, second spine 1⅕ to 1¼, first ray 1⅓ to 1⅔, often simple; caudal sharply forked, 2⅕ to 2⅗ in combined head and body; pectoral 2⅗ to 2¾; ventral 2⅗ to 2¾; least depth of caudal peduncle 2 to 2$\frac{1}{10}$ in head.

Back light brown, sides and lower surface light yellowish. Iris yellowish. Infraorbital grayish-white. Base of spinous dorsal neutral brown, all fins otherwise yellowish white. Small brown spot at pectoral origin and axil pale.

East Indies and China. Not previously reported from the Philippines.

A trim species, readily known by the second anal spine longer than the anal rays and the antero-median dorsal spines longest.

9 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 103 mm.
1 example, Danawan. September 27, 1909. Length, 116 mm.
4 examples, Sipadan Island. September 28, 1909. Length, 128 to 130 mm.

Subgenus HOPLOCHROMIS Fowler

Front edge of lower jaw with 6 short conic teeth flaring outward.

CHROMIS CAERULEUS (Cuvier)

Heliases caeruleus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 497. New Guinea and Ulea.

Heliases coeruleus SCHLEGEL and MÜLLER, Nat. Ges. Nederl. Zool., 1839–44, p. 25.

Heliastes caeruleus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 62.

Chromis caeruleus BEAUFORT, Bijd. Dierk., Amsterdam, vol. 19, 1913, p. 129 (Ambon).—FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 66 (Philippines); Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Heliases lepisurus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 498. New Guinea.—SCHLEGEL and MÜLLER, Nat. Ges. Nederl. Zool., 1839–44, p. 25.

Heliastes lepidurus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 63 (Amboina); Fishes of Zanzibar, 1866, p. 84 (Zanzibar).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—DAY, Fishes of India, pt. 3, 1877, p. 389, pl. 82, fig. 1 (Andamans).—KOSSMANN and RÄUBER, Zool, Ergebn. K. Acad. Wiss. Berlin, vol. 1, 1877, p. 24 (Red Sea).—DAY, Faun. British India, vol. 2, 1889, p. 391, fig. 130.—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 31 (Japan).—BEAN and WEED, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 608 (Batavia, Java).

Chromis lepisurus BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 7; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 164 (Cocos Island, Java, Bawean, Celebes, Sumbawa, Flores, Timor, Ternate, Buru, Ceram, Amboina, Banda, Aru, New Guinea).—STEINDACHNER, Abhandl. Senckenberg Ges., vol. 25, 1900, pp. 440 (Ternate).

Chromis lepidurus WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 358 (Borneo Bank, Celebes Sea, Damar, Sanguisiapo in Sulu Archipelago, Saleyer, Rotti).

Heliases frenatus CUVIER, Hist. Nat. Poiss., vol. 5, 1830, p. 498. Guam.—GUÉRIN, Icon. R. An. Cuvier Poiss., 1830–44, pl. 19, fig. 3.—SAUVAGE, Hist. Madagascar, Poiss., 1891, p. 436, pl. 28, fig. 1 (Madagascar).

Glyphisodon bandanensis BLEEKER, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 248. Neira, Banda.

Glyphidodon anabatoides (not BLEEKER) DAY, Proc. Zool. Soc. London, 1870, p. 696.

Depth 2⅛ to 2⅕; head 3 to 3⅔, width 1⅘ to 2. Snout 3⅖ to 3½; eye 2¾ to 3, greater than snout, about equals interorbital;

maxillary not to front pupil edge, 2¼ to 2⅖ in head; teeth small, conic, well spaced, short, mostly uniserial with 2 short canines in front; inside front of each jaw row of small inconspicuous teeth; front edge of lower jaw with 6 short conic teeth externally, all directed outward; interorbital 2¾ to 3, well convex; infraorbital not free below and behind eye. Gill rakers 9+21, lanceolate, moderate.

Tubes in lateral line 15 or 16, pores in straight section 9 or 10 + 1 or 2; 1 scale above lateral line, 7 or 8 below, 25 to 28 predorsal forward to snout tip; dorsals and anals naked, except very few inconspicuous basal scales; 4 rows of cheek scales. Scales with 6 basal radiating striae; apical denticles 78 to 130, with 1 to 4 transverse series of basal elements; circuli fine.

D. XII, 9 or 10, third spine 1⅘ to 1⅞ in head, fourth ray 1⅕ to 1¼; A. II, 9, 1, second spine 2⅓ to 2⅖, fourth ray 1⅖ to 1⅗; least depth of caudal peduncle 2 to 2¼; caudal 3⅙ to 3⅔ in combined head and body, forked, lobes slender and end in filaments; pectoral 1 to 1$\frac{1}{10}$ in head; ventral 1 to 1⅛.

Pale gray-blue generally, fading brownish on back in alcohol, paler to whitish below. Above, each scale with slightly darker center. Edge and base of spinous dorsal dusky, otherwise vertical fins slightly dusky. Pectoral and ventral pale, with front edge of latter whitish. Pectoral axil often very slightly dusky.

Red Sea, Zanzibar, Mauritius, East Indies, Melanesia, Micronesia, Polynesia.

11 examples, Alimango Bay, Burias Island. March 5, 1909. Length, 57 to 92 mm.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 73 mm.

1 example, Balikias Bay, Lubang Island. July 17, 1908. Length, 37 mm.

3 examples, Biri Channel. June 1, 1909. Length 81 to 83 mm.

2 examples, Bongao Anchorage. February 22, 1908. Length, 33 to 40 mm.

10 examples, Bubuan Island, Jolo. February 14, 1908. Length, 51 to 81 mm.

2 examples, Bulan Island, Samales Group. September 13, 1909. Length, 60 to 64 mm.

15 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 47 to 80 mm.

8 examples, Candaraman Island, Balabac. January 4, 1909. Length, 67 to 77 mm.

2 examples, Cataingan Bay, Masbate Island. November 14, 1909. Length, 70 to 75 mm.

15 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 50 to 65 mm.

3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 50 to 64 mm.

1 example, Guntao Island. December 20, 1908. Length, 70 mm.

1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 40 mm.

8 examples, Langao Point, Luzon. June 24, 1907. Length, 62 to 88 mm.

12969, 14686, 14687. Langao Point, Luzon. June 24, 1909. Length, 65 to 104 mm.

1 example, Ligpo Point, Balayan Bay. January 18, 1908. Length, 43 mm.
1 example, Limbones Cove. February 8, 1909. Length, 75 mm.
3 examples, Little Santa Cruz Island. May 28, 1908. Length, 75 to 104 mm.
1 example, Mactan Cove, Mactan Island. April 6, 1908. Length, 87 mm.
2 examples, Mactan Island, Cebu. March 25, 1909. Length, 75 to 125 mm.
21101. Maculabo Island. June 14, 1909. Length, 70 mm.
6 examples, Makyan Island. November 29, 1909. Length, 58 to 102 mm.
1 example, Mantacao Island, west coast Bohol. April 8, 1908. Length, 59 mm.
2 examples, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 58 to 60 mm.
1 example, Opol, Mindanao. August 4, 1909. Length, 70 mm.
10 examples, Pandanon Island. March 23, 1909. Length, 49 to 67 mm.
5 examples, Porongpong Island, Palumbanes Group. June 11, 1909. Length, 63 to 90 mm.
2 examples, Pendek Island. December 15, 1909. Length, 41 to 43 mm.
1 example, Philippines. Length, 72 mm.
4 examples, Pilas Island. September 12, 1909. Length, 53 to 66 mm.
2 examples, Port Maricaban. July 21, 1908. Length, 68 to 80 mm.
1 example, Port Palapag. June 2, 1909. Length, 59 mm.
14591 and 14593. Port Palapag. June 3, 1909. 43 examples. Length, 50 to 84 mm.
1 example, Romblon. March 25, 1908. Length, 36 mm.
3 examples, Romblon. March 26, 1908. Length, 62 to 76 mm.
21066. Sablayan, Mindoro. December 12, 1908. 8 examples. Length, 55 to 70 mm.
2 examples, Sacol Island. September 9, 1909. Length, 70 mm.
2 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 67 or 68 mm.
19540. Singaan Island. September 21, 1909. Length, 71 mm.
1 example, Surigao, Mindanao. May 8, 1908. Length, 56 mm.
5 examples, Tapiantana Island. September 13, 1909. Length, 50 to 59 mm.
2 examples, Tara Island. December 14, 1908. Length, 70 to 89 mm.
2 examples, Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 33 to 55 mm.
14482. Tomahu Island. December 12, 1909. Length, 100 mm.
6153. Tonquil Island, east of Gumila Reef. September 14, 1909. 2 examples. Length, 58 to 65 mm.
13162. Tumindao Island, reefs of south lagoon. February 26, 1908. Length, 34 to 82 mm. [353 and 354.] 8 examples. Upper parts bright green, lower silvery; middle washed with yellow, most noticeable in small specimen under 50 mm. in length; in latter dorsal and anal tipped with lemon yellow, axil plain; black spot at upper angle and very light yellowish bar on base. In larger specimen bright azure line in front of premaxillary, another across preorbital to eye; tip of lower jaw azure; yellow disappears from dorsal in some specimens, in others remains on both dorsal and anal. Greens turn blue in formalin.
50. Tulnalutan Island. September 9, 1909. Length, 50 mm.
3 examples, Tutu Bay, first anchorage, Jolo. September 19, 1909.
6 examples, Tifu Bay, Bouro Island. December 10, 1909. Length, 54 to 61 mm.
3 examples, Dodepo and Pasejogo Islands, Celebes. November 19, 1909. Length, 53 to 70 mm.
65803. U.S.N.M. Tari Tari, Gilbert Islands. *Albatross* collection. 21 examples. Length, 33 to 68 mm.

15116 U.S.N.M. Samoa. Steinberger. 6 examples. Length, 19 to 30 mm.
28553 U.S.N.M. Fiji. Museum Hist. Nat. Paris. 3 examples. Length, 39 to 45 mm.
52332 U.S.N.M. Samoa. Bureau of Fisheries. 24 examples. Length, 22 to 112 mm.
65463 U.S.N.M. Mangareva, Gambier Islands. *Albatross* collection. 24 examples. Length, 51 to 104 mm.
65804 U.S.N.M. Kusaie, Carolines. *Albatross* collections. 4 examples. Length, 57 to 64 mm.
31625 to 31654 A.N.S.P. Pago Pago, Samoa. Bureau of Fisheries.
51180 and 71181 A.N.S.P. Pago Pago. Capt. C. F. Silvester.
48653 to 48658 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 30 to 73 mm.

Genus CHEILOPRION Weber

Cheiloprion Weber, Siboga Exp., Fische, vol. 57, 1913, p. 342. Type *Pomacentrus labiatus* Day, monotypic.

Ovoid, rather deep. Head moderate. Eye large. Lips very wide, fleshy, papillose. Teeth fine, slender, uniserial, compressed, form even cutting-edge. Infraorbital edge free. Preopercle edge entire. Scales extend forward to end of snout, not on preorbital or suborbitals. Vertical fins scaly. Dorsal spines 13, rays 12 or 13. Anal spines 2, rays 12. Caudal little emarginate.

East Indian region. A well marked genus with broad papillose lips.

CHEILOPRION LABIATUS (Day)

Pomacentrus labiatus Day, Fishes of India, pt. 3, 1877, p. 384, pl. 81, fig. 2. Andamans and Nicobars; Faun, Brit. India, vol. 2, 1889, p. 385.
Cheiloprion labiatus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 342, fig. 73 (head) (Beo, Karakelan Island).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, 1913, p. 127 (Ambon).—Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 53 (Philippines).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 1⅘ to 1⅞; head 2⅘ to 2⅞, width 1¾ to 1⅘. Snout 3⅖ to 3½; eye 3 to 3¼, greater than snout, 1 to 1¼ in interorbital; mouth small; maxillary ¾ to ⅘ to eye, 3⅘ to 4 in head; interorbital 2¾ to 3⅓, convex. Gill rakers 2+9, robust, pointed, moderate.

Tubes in lateral line 17, pores in straight section 8 or 9 to caudal base; 3 scales above lateral line, 9 or 10 below, 20 predorsal; cheek with 4 rows of scales, of which row on preopercle flange small. Scales with 7 to 9 basal radiating striae, edge scalloped; apical denticles 80 to 103, small, with single row of basal elements; circuli very fine.

D. XIII, 12, 1 or 13, 1, thirteenth spine 2 to 2⅕ in head, fifth ray 1⅖ to 1⅗; A. II, 12, 1, second spine 3 to 3⅛, fifth ray 1¼ to 1½; caudal emarginate, upper lobe little longer, 1⅛ to 1⅕; least depth of caudal peduncle 2⅕ to 2½; pectoral 1 to 1⅕; ventral 1⅓ to 1¾.

Largely uniform brownish generally. Fins same. Lips little paler.

Andamans, Nicobars, East Indies and Philippines.

1 example, Butauanan Island. June 13, 1909. Length, 69 mm.
1 example, Biri Channel. June 1, 1909. Length, 70 mm.
14436. Gubat Port, Luzon. June 23, 1909. Length, 75 mm.
14704. Matnog Bay. May 31, 1909. Length, 70 mm.
1 example, Philippines. Length, 60 mm.
1 example, Port Palapag. June 3, 1903. Length, 75 mm.
1 example, Simaluc Island. September 22, 1909. Length, 80 mm.
14387. Talisse Island. November 9, 1909. Length, 85 mm.
49013 to 49017 A.N.S.P. Philippines. Commercial Museum of Philadelphia Length 45 to 72 mm.

Genus POMACENTRUS Lacépède

Pomacentrus LACÉPÈDE, Hist. Nat. Poiss., vol. 4, 1803, p. 505. Type *Chaetodon pavo* BLOCH, designated by BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 2, vol. 3, 1877, p. 40.

Pristotis RÜPPELL, Neue Wirbeith., Fisch., 1835, p. 128. Type *Pristotis cyanostigma* RÜPPELL, monotypic.

Dischistodus GILL, Proc. Acad. Nat. Sci. Phila., 1863, p. 214. Type *Pomacentrus fasciatus* CUVIER, orthotypic.

Pseudopomacentrus BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, No. 6, ser. 2, vol. 3, 1877, p. 41. Type *Pomacentrus littoralis* (KUHL and VAN HASSELT) VALENCIENNES.

Parapomacentrus BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 2, vol. 3, 1877, p. 65. Type *Pomacentrus polynema* BLEEKER, designated by JORDAN, Stanford Publications (Genera of Fishes, 3), 1919, p. 387.

Amblypomacentrus BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 2, vol. 3, 1877, p. 68. Type *Glyphisodon breviceps* SCHLEGEL and MÜLLER, designated by JORDAN, Stanford Publications (Genera of Fishes, 3), p. 387.

Eupomacentrus BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 2, vol. 3, 1877, p. 73. Type *Chaetodon lividus* (FORSTER) SCHNEIDER, monotypic (in subgenus).

Brachypomacentrus BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 2, vol. 3, 1877, p. 73. Type *Pomacentrus albifasciatus* SCHLEGEL and MÜLLER, monotypic (in subgenus).

Ovate or oblong. Head moderate, about deep as long, front profile steep, usually rounded. Mouth small, broad, terminal, jaws equal or subequal. Teeth in 1 or 2 close-set rows, compressed, immovable, truncate or rounded at tips. Preorbital and infraorbitals more or less serrate, former often with deep notch. Preopercle more or less serrate. Gill rakers moderate or long. Scales large, 28 to 31 in median lateral series. Muzzle usually scaly. Dorsals and anals with large basal scaly sheaths. Dorsal with 12 to 14 low stout spines, rays 10 to 16, more or less elevated. Anal spines 2, rays 12 to 16. Caudal forked or emarginate, lobes rounded, sometimes end in filaments.

Species numerous, brilliant, often very variable and abundant in tropical seas. Most are of small size and found frequenting tide pools and coral reefs.

ANALYSIS OF THE SPECIES

a^1. Dorsal spines 13 (rarely 14).
  b^1. Teeth biserial.
    c^1. POMACENTRUS. Snout scaled.
      d^1. Dorsal spines 13.
        e^1. Outer row of teeth truncate terminally, close-set and form compact cutting edge.
          f^1. No dark and light contrasted streaks or blotches on opercle or longitudinally on caudal peduncle.
            g^1. Cheek scales in 2 rows above preopercle ridge.
              h^1. Median lateral scales each with light blue vertical line. pavo.
              h^2. Median lateral scales each with small blue spot caeruleus.
            g^2. Cheek scales in 3 rows above preopercle ridge.
              i^1. Preopercle limb scaled posteriorly; caudal without upper and lower dusky border violescens.
              i^2. Preopercle limb not scaled posteriorly; caudal with upper and lower borders dusky taeniurus.
          f^2. Dark and light contrasted blotches on opercle and as longitudinal bands on caudal peduncle smithi.
        e^2. Outer row of teeth conic terminally, cutting-edge less compact.
          j^1. Pectoral without dark axillary blotch, within which small white spot.
            k^1. Preorbital scaly; preorbital and infraorbital serrae large littoralis.
            k^2. Preorbital scaleless.
              l^1. Cheek with 2 rows of scales above preopercle ridge; pectoral base with large black blotch; light brown to blackish melanopterus.
              l^2. Cheek with 3 rows of scales above preopercle ridge; pectoral origin never with large black blotch, when present always less than pupil; anal often with 2 whitish, parallel, submarginal lines anteriorly yellowish to dusky.
                m^1. No sky-blue line over eye; no black ocellus on last dorsal rays or caudal peduncle above; yellowish amboinensis.
                m^2. Several sky-blue lines from snout over eye sometimes present; black ocellus on last dorsal rays or on caudal peduncle above. tripunctatus.
          j^2. Pectoral with dark axillary blotch, within which small white spot; brown grammorhynchus.
      d^1. Dorsal spines 13 or 14; black spot at pectoral origin.
        n^1. Vertical fins uniformly brown or dusky.
          o^1. Suborbitals scaled lepidogenys.
          o^2. Suborbitals naked reidi.
        n^2. Anal pale, with black blotch on last 5 rays terminally stigma.

c^2. DISCHISTODUS. Snout scaleless.

p^1. Lower preopercle limb and interorbital scaly; preopercle edge strongly dentate.

q^1. Outer mandibular teeth more or less truncate.

r^2. Interorbital scales not extending forward to nostrils; second anal spine less than postocular region.

s^1. Round black nuchal blotch, second at front median dorsal spines, third on hind dorsal rays; 2 blue bands transversely on interorbital. **perspicillatus.**

s^2. Back without round black blotches; single blue line across interorbital. **prosopotaenia.**

r^2. Interorbital scales extend forward to nostrils; second anal spine longer than postocular; head and front of trunk brown, rest yellowish; black ocellus at eighth and ninth dorsal spines in young ---------- **notophthalmus.**

q^2. Outer mandibular teeth more or less rounded, not truncate; interorbital scales not extending before eye; brown, with 2 transverse blue interorbital lines; yellowish spot on back at median dorsal spines---------- **pristiger.**

p^2. Lower preopercle limb and interorbital scaleless; outer mandibular teeth rounded terminally; back with 4 large, transverse bands; cluster of black spots behind gill opening---------- **fasciatus.**

b^2. Teeth uniserial.

t^1. PARAPOMACENTRUS. Snout scaly; head, in profile, more conic or attenuate; soft dorsal and anal with front half dusky, posterior half strongly contrasted yellowish white; black basal pectoral blotch over most of pectoral base and into axil of fin---------- **ovoides.**

t^2. AMBLYPOMACENTRUS. Snout scaleless; head very obtuse.

u^1. Caudal uniformly pale. **breviceps.**

u^2. Caudal with large black basal blotch---------- **beauforti.**

a^2. EUPOMACENTRUS. Dorsal spines 11 or 12; teeth uniserial, truncate; head strongly obtuse; suborbitals and preopercle serrated; snout scaled.

v^1. Suborbitals naked; body longer, depth 2 to 2⅕------ **lividus.**

v^2. Suborbitals densely scaled; body deeper, depth 1⅞ to 2. **nigricans.**

POMACENTRUS PAVO (Bloch)

Chaetodon pavo Bloch, Naturg. Ausl. Fisch., vol. 3, 1787, p. 60, pl. 198. East Indies.

Pomacentrus pavo Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 505, 508 (East Indies).—Rüppell, Atlas Reise, Nördl. Afr. Fisch., 1828, p. 37 (Massaua).—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 413 (Moluccas).—Valenciennes, Règne An. Cuv. Ill., 1839, pl. 32, fig. 3.—Schlegel and Müller, Verh. Nat. Ges. Nederl., Zool., vol. 2, 1839–44, p. 20 (Moluccas).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 23 (Amboina); Fishes of Zanzibar, 1866, p. 81 (Zanzibar and Mozambique).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 523 (copied).—Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 99 (Cebu).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 408(9), fig. 9.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 227, pl. 124, fig. E (Red Sea, East Africa, Tahiti, Ponape, Bonin Islands).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 545 (Cebu).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 336 (Sanguisapo, Sulu Archipelago, Damar, Saleyer, Ambon, Tuir).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Pomacentrus (Pomacentrus) pavo Bleeker, Nat. Verh. Holl. Maatsch Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 42 (Sumatra, Nias, Java, Bawean, Celebes, Sangi, Solor, Timor, Ternate, Buro, Ceram, Amboina, Haruko, Nussalaut, Obi-major, Banda, Goram, Cebu, New Guinea).

Holocentrus diacanthus Lacépède, Hist. Nat. Poiss, vol. 4, 1802, pp. 333, 373. No locality (on Chinese Mss.).

Pomacentrus pavoninus Bleeker, Nat. Tijds. Ned. Indie., vol. 5, 1853, p. 85. Lawajong, Solor.

Pomacentrus ? furcatus Thiollière, Faun. Woodlark, 1857, p. 201. Woodlark Island.

Pomacentrus notatus Macleay, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 451. New Britain.

Depth 2¼ to 2⅖; head 3⅓ to 3⅗, witdth 1⅘ to 1⅞. Snout 4⅕ to 4½; eye 2⅘ to 3⅖, greater than snout, equals interorbital or greater in young; maxillary extends little beyond front eye edge, though not quite to pupil, 3 to 3⅕ in head; teeth uniserial, little compressed, pointed; interorbital 3 to 3⅕, but slightly convex; infraorbital and hind preopercle edges denticulate. Gill rakers 6+14, lanceolate, slender, moderate.

Tubes in lateral line 16 or 17, pores in straight section 9 or 10+1 or 2; scales above lateral line 3, below 9, predorsal 15 to 17, extending forward opposite nostrils; 3 rows of cheek scales, infraorbital naked. Scales with 7 or 8 basal radiating striae; apical denticles 88 to 119, with 1 to 3 transverse series of basal elements; circuli fine.

D. XIII, 12, I or 13, I, thirteenth spine 1⅔ to 1¾ in head, seventh ray 3⅖ to 3½ in combined head and body; A. II, 13 I or 14 I, second spine 1⅗ to 1⅞ in head, ninth ray 1 to 1⅗; least depth of caudal peduncle 1⅘ to 1⅞; caudal deeply lunate, 2⅕ to 2¼ in combined head and body; pectoral 3⅖ to 3¾; ventral 3⅓ to 3⅗.

Ecru-drab generally, lower surface pale to whitish. Head spotted with blue-gray, usually with more or less horizontal distribution.

Iris neutral, with several blue-gray bars, spots or lines. Blue black blotch on opercle about size of pupil below origin of lateral line. Upper border of back all speckled or mottled with azure, and chest breast and belly with blue spots, rather large and below disposed as several longitudinal rows to form streaks. Anal base and adjacent region of tail with white azure spots. Each scale along middle of sides with deep brown median streak or band, vertically followed by an azure one, producing vertically streaked appearances. Spinous dorsal neutral blue, with some azure lines terminally. Several azure bars basally to each membrane and several median vertical lines to each membrane medially. Soft dorsal and anal more neutral gray and inconspicuously with azure spots and lines, obsolete terminally. Both dorsals and anals rather dusky terminally. Caudal dull or pale brownish, also paired fins.

Red Sea and East Africa to the East Indies and Tahiti. In its pleasing design and delicate shades of blue this is easily the gem of the family. Its variations are usually slight and specimens are mostly quite uniform.

2 examples, Bumbum Island. September 25, 1909. Length, 54 to 60 mm.

1 example, Cagayan. January 8, 1909. Length, 89 mm.

1 example, Galera Bay, Mindoro. June 9, 1908. Length, 80 mm.

4 examples, Gomomo Island. December 3, 1909. Length, 52 to 76 mm.

9 examples, Mactan Cove, Mactan Island. April 6, 1908. Length, 76 to 108 mm.

1 example, Murcielagos Bay. August 9, 1909. Length, 75 mm.

35 examples, Pandanon Island. March 23, 1909. Length, 50 to 90 mm.

5 examples, Philippines. Length, 43 to 78 mm. [308 to 310.] Bright indigo-blue, showing mainly as central areas on scales, margins paler; on anterior portion of body and head blue appears as blotches and stripes on olive-green ground; slate-black blotch size of pupil at upper angle of pectoral; belly pale, without marks. Dorsal bluish, spinous tips bright blue, 3 or 4 paler broken bars lower; vertical edge of dorsal with pale yellowish blotch. Caudal pale yellow and dusky. Anal pale slaty, blue rays washed with greenish. Ventral dusky-greenish, hyaline; pectoral pale yellow. Vent black. Iris dark.

2 examples, Port Matalvi, Luzon. November 23, 1908. Length, 55 to 81 mm. [714, 718.]

20051. Romblon. March 26, 1908. Length, 82 mm.

1 example, Tataan, Simaluc Island. February 20, 1908. Length, 94 mm. [163.] Sapphire-blue confined to vertical bar on each scale with gray ground; on front or nuchal region and head, longitudinal lines. Dorsal body-color, yellowish blotch on vertical part. Caudal yellowish, dusky at base. Anal blue. Ventral pale, yellowish at tip. Pectoral lemon-yellow, bluish on first ray. Iris spotted as head.

1 example, Tomahu Island. December 11, 1909. Length, 89 mm.

8 examples, Tumindao Island. February 26, 1908. Length, 88 to 102 mm.

20333 and 20334. Tutu Bay, Jolo. September 19, 1909. Length, 90 to 100 mm.

3 examples, Basa Reef, Gulf of Boni, Celebes, Dutch East Indies. December 17, 1909. Length, 29 to 39 mm.

52309 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 12 examples. Length, 27 to 66 mm.

65993 U.S.N.M. Tari Tari, Gilbert Islands. *Albatross* collections. 2 examples. Length, 61 to 83 mm.
31253 to 31264 A.N.S.P. Apia. Bureau of Fisheries. Length, 29 to 59 mm.
48619 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 50 mm.

POMACENTRUS CAERULEUS Quoy and Gaimard

Pomacentrus caeruleus Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 397, pl. 64, fig. 2. Mauritius.—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 418 (Mauritius).—Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 429 (type).

Depth 2⅖ to 2¾; head 3⅓ to 3⅖, width 1⅔ to 1⅘. Snout 4 to 4⅛; eye 2⅞ to 3, greater than snout or interorbital; maxillary reaches opposite front eye edge, 3⅛ to 3¼ in head; teeth uniserial, compressed, ends rounded; interorbital 3 to 3⅓, broadly convex; infraorbital edge entire; preopercle edge rather coarsely denticulate behind. Gill rakers 8+13, lanceolate, slender, long.

Tubes in lateral line 16 or 17, pores 8 or 9+1 or 2; 3 scales above lateral line, 9 below, 16 predorsal; 3 rows of cheek scales, infraorbital naked and row on preopercle flange much smaller than others. Scales with 8 or 9 basal radiating striae; apical denticles 73 to 81, with single or double row of basal elements; circuli fine.

D. XI to XIII, 13, 1 or 14, 1, thirteenth spine 1⅔ to 1¾ in head, eighth ray 1⅓ to 1⅖, often first and second rays simple; A. II, 14, 1 or 15, 1, second spine 1⅔ to 1¾, ninth ray 1¼ to 1⅓, often first ray simple; least depth of caudal peduncle 1⅞ to 2; pectoral 1 to 1⅛; ventral 1 to 1$\frac{1}{10}$; caudal emarginate, 2½ to 3 in combined head and body.

Cobalt blue generally, variegated with azure, producing dark mottled appearance on head above and along back above lateral line. Blue bar from end of snout to eye and blue line all along lower eye border on infraorbital. Upper scale of opercle at beginning of lateral line with black spot, less than half size of pupil. Smaller and less defined dusky spot at pectoral origin. Iris pale olivaceous or yellowish. Dorsals and anals largely deep neutral gray, soft fins slightly olivaceous basally. Caudal and caudal peduncle largely dull brownish, with olivaceous tinge on caudal, of which hind border slightly deep gray. Paired fins pale or light brownish.

Mauritius and Philippines. We have compared this species carefully with *Pomacentrus pavo*, from which it differs in no way except color pattern and the more plump body. In *P. pavo* the pale blue spots on the head are always smaller and tend to form lines or streaks, these also extending along the upper and lower or submarginal portions of the body. The enclosed median space of the sides is then contrasted by vertical pale streaks, only as spots posteriorly in the young. In *P. caeruleus* the coloration is more as shown in

Jordan and Seale's figure of *P. pavo*, though the spots on the head in our specimens large. In this connection we have also made the comparison with a series of examples from Apia, reported by Jordan and Seale as *P. pavo* and 2 from Tari Tari in the Gilbert Islands. The Samoan examples also emphasize very clearly, as they were preserved in formaline, the blue lines on the head of some individuals turning very dark and thus giving an entirely different appearance. In general superficial appearance the species is greatly suggestive of *Abudefduf unimaculatus*. Previously only known from Mauritius.

1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 50 mm.

4 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 25 to 60 mm. One with egg strings of copepod crustacean parasite protruding from right side.

1976. Gondra Island, near Bolipongpong Island. September 20, 1909. Length, 68 mm. Bright blue above, head fading to slaty; side from upper base of pectoral washed with yellow; posterior portion of body from about sixth soft dorsal ray cadmium-yellow, including remainder of dorsal fin and all caudal fin; dorsal otherwise slaty, narrow paler lines across soft part near its margin; anal olivaceous, becoming yellowish at base, obscure paler lines through distal portion; paired fins yellowish.

1 example, Makyan Island. November 29, 1909. Length, 48 mm.

1 example, Simaluc Island. September 22, 1909. Length, 64 mm.

2 examples, Sitanki Reef. September 24, 1909. Length, 67 to 69 mm.

11497. Sulade Island. September 17, 1909. Length, 63 mm. 2 examples. [1942.] Upper parts blue, becoming gray on breast and belly; dorsal with black margin, gray anteriorly, yellow posteriorly; blue of body running into soft part; caudal yellow; anal similar to soft dorsal, less yellow; paired fins pale yellow.

1050. Tulnalutan Island. September 9, 1909. Length, 60 mm.

1 example, Limbe Strait, Celebes. November 10, 1909. Length, 56 mm.

POMACENTRUS VIOLESCENS (Bleeker)

Pristotis violescens Bleeker, Journ. Ind. Arch., vol. 2, 1848, p. 637. Sumbawa.

Pomacentrus violescens Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 20 (East Indies).—Martens, Preuss. Exp. Ost Asien, 1876, p. 396 (Amboina R.).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 408 (9), fig. 6.

Pomacentrus (*Pomacentrus*) *violescens* Bleeker, Nat. Ver. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 46 (Nias, Sumbawa, Flores, Buru, Amboina, Ceram).

Dascyllus xanthurus Bleeker, Nat. Tijd. Ned. Indie, vol. 4, 1853, p. 117. Amboina.

Pomacentrus rathbuni Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 754. Near Yokohama.

Depth 2¼ to 2⅖; head 3¼ to 3⅖, width 1⅔ to 1⅞. Snout 3⅔ to 4$\frac{1}{10}$; eye 2⅘ to 3, greater than snout or interorbital; maxilliary reaches but little beyond front of eye, 2¾ to 3⅕ in head; teeth uniserial, compressed, blunt to more or less truncate, sometimes

somewhat rounded; interorbital 2⅞ to 3, broadly convex; lower infraorbital and hind preopercle edges feebly serrate. Gill rakers 7+16, lanceolate, long, slender.

Tubes in lateral line 16 to 18, pores in straight section 6 to 9+0 to 2; 3 scales above lateral line, 8 or 9 below, 17 to 20 predorsal; 4 or 5 rows of cheek scales. Scales with 8 or 9 basal radiating striae; apical denticles 77 to 125, with 2 or 3 transverse rows of basal elements; circuli very fine.

D. XIII, 10, 1 or 11, 1, thirteenth spine 2$\frac{1}{10}$ to 3⅛ in head, fourth ray 1$\frac{1}{10}$ to 1⅛, first ray sometimes simple; A. II, 11, 1, second spine 1⅞ to 2, sixth ray 1⅛ to 1⅕, with first and second rays sometimes simple; least depth of caudal peduncle 1⅞ to 2; pectoral 1 to 1¼; ventral 1; caudal forked, 2⅛ to 3⅛ in combined head and body.

Body chocolate to neutral brown, base of each scale with pale bluish spot, on head smaller. Blue-gray line from snout tip to eye. Iris neutral brown. Suprascapula with dusky blotch about size of pupil, always smaller than dark basal pectoral blotch. Dorsals neutral dusky, with last half of fin abruptly pale yellowish to white, the dusky of anterior portion reaching back marginally to ends of longest rays. Caudal peduncle and caudal fin largely uniform pale yellowish, hind edges pale grayish. Anal dusky brown. Pectoral brownish, with large dusky-black basal blotch and ventral often darker than pectoral.

East Indies, Japan. A very handsome trim little fish, chiefly noted for the abrupt light hind portion of the dorsal, tail, and caudal fin. It differs at once in the uniform yellow caudal from *Pomacentrus taeniurus*, though agrees with *Abudefduf bankieri* in that respect. From the last it may easily be known by the entire pectoral base blackish and the dark area of the soft dorsal extending back to the tips of the longest rays.

1 example, Capunuypugan, Mindanao. May 10, 1908. Length, 62 mm.
1 example, Caracaran, Batan Island. June 8, 1909. Length, 69 mm.
4 examples, Cebu dock. September 5, 1909. Length, 51 to 57 mm.
1 example, Port Uson, Busuanga Island. December 19, 1908. Length 64 mm. [947.] Very dark brown; vertical edge of dorsal, anal, and caudal bright cadmium-orange; base of pectoral black, fin dusky; indistinct bar under incised tips of spinous dorsal shows by transmitted light.
1 example, Subig Bay. January 7, 1908. Length, 49 mm.
8413. Hokuho, Soo Wan, Formosa. January 29, 1910. Length, 65 mm.
49706 U.S.N.M. Yokohama, Japan. P. L. Jouy. Type of *Pomacentrus raihbuni*.

POMACENTRUS TAENIURUS Bleeker

Pomacentrus taeniurus Bleeker, Act. Soc. Ind. Néerl. (Amboina), vol. 1, 1856, p. 51. Amboina.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 22 (East Indies).—Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 100 (Ubay).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 408 (9), fig. 2.—Klunzinger, Sitzs. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 397

(Port Denison).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Hirado).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 544 (Bohol, Cebu, Ubay).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 89 (Philippines).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 337 (Beo and Postillion Island).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Pomacentrus (*Pomacentrus*) *taeniurus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 47 (Biliton, Buru, Amboina, Philippines).

Pomacentrus cyanomos Bleeker, Nat. Tijds. Ned. Indie, vol. 11, 1856, p. 89. Batavia.—Bleeker, Atlas Ich. Ind. Néerl., 9, 1877, pl. 408 (9), fig. 3.

Pomacentrus cyanomus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 21 (East Indies).—Martens, Preuss. Exp. Ost Asien, 1876, p. 396 (Yokohama).

Pomacentrus (*Pomacentrus*) *cyanomos* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 45 (Java and Ceram).

Glyphisodon amboinensis Bleeker, Act. Soc. Sci. Ind. Néerl. (Amboina), vol. 2, 1857, p. 72. Amboina.

Glyphidodon amboinensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 56 (copied).

Pomacentrus leucosphyrus Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 533, pl. 19, lower left figure. Padang, Sumatra.

Depth 2¼ to 2½; head 3⅓ to 3½, width 1⅔ to 1⅘. Snout 3⅞ to 4; eye 2⅔ to 3⅕, greater than snout or interorbital; maxillary reaches little beyond front of eye or to front pupil, edge in young, 3 to 4 in head; teeth compressed, uniserial, truncate, interorbital 3 to 3¼, broadly convex; lower infraorbital edge entire; hind preopercle edge weakly and rather irregularly serrate. Gill rakers 8+14 lanceolate, long, slender.

Tubes in lateral line 15 or 16, pores in straight section 9+2; 4 scales above lateral line, 9 below, 17 or 18 predorsal; 4 rows of cheek scales, uppermost on infraorbital. Scales with 6 or 7 basal radiating striae, apical denticles 79 to 90, with 4 or 5 transverse series of basal elements; circuli fine.

D. XIII, 10, 1 or 11, 1, thirteenth spine 1¾ to 1⅘ in head, fifth ray 3 to 3¼ in combined head and body; A. II, 10, 1 or 11, 1, second spine 1½ to 1⅗ in head, fifth ray 2½ to 3½ in combined head and body, first ray sometimes simple; caudal 1⅞ to 2¼, deeply forked, lobes slender and ending in filaments; ventral 3 to 3⅖; pectoral 1 to 1⅛ in head; least depth of caudal peduncle 2 to 2⅓.

Deep umber, little paler below or on abdomen and under surface of head. At present all show a dark and more or less uniform appearance and very few with traces of gray spots, these on lower surfaces. Large neutral black blotch at beginning of lateral line, its size but little less than eye. Another small, dusky spot at pectoral origin and axil of fin dusky black. Vertical fins all largely dusky or dull blackish, with dull gray or whitish submarginal line or as narrow band on spinous dorsal, not always distinct. Likewise, last

5 dorsal rays and membranes whitish, sometimes scarcely paler than rest of fin. Median caudal rays always paler than rest of caudal though variably grayish to whitish, upper and lower lobes greatly contrasted. Pectoral brown. Ventral blackish. Iris brownish-yellow.

East Indies, Australia, Japan. The dark borders to the upper and lower caudal lobes and the usual whitish blotch at the bases of the last dorsal rays are distinctive.

The nominal *Pomacentrus cyanomos* Bleeker was based on a single example 106 mm. long. It appears to represent a mature condition of the present species. We have smaller examples, which in every way agree and which we are unable to separate, due doubtless to different conditions in the preparation.

The type of *Pomacentrus lucosphyrus* is a large example of the present species. It differs only in its largely black coloration, the outer terminal ends of the ventrals alone contrasted whitish.

22628. Alimango River, Burias Island, March 5, 1909, length 68 mm.
1 example, Busin Harbor, Burias Island. March 8, 1909. Length, 56 mm.
12 examples, Butauanan Island. June 13, 1909. Length, 50 to 98 mm.
42 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 34 to 95 mm.
1 example, Capunuypugan, Mindanao. May 10, 1908. Length, 54 mm.
1 example, Cara[illegible] Batan Island. June 8, 1909. Length, 63 mm.
17 examples, Cata[illegible] Bay, Masbate Island. April 17, 1908. Length, 26 to 63 mm.
14 examples, Cataingan Bay. April 18, 1908. Length, 35 to 70 mm.
3 examples, Cataingan Bay. November 14, 1909. Length, 43 to 54 mm.
5911 and 5920 B. F. Catbalogan, Samar. April 15, 1908. Length, 58 to 90 mm.
24 examples, Cebu dock. September 5, 1909. Length, 45 to 75 mm.
2 examples, Endeavor Strait. December 22, 1908. Length, 47 to 52 mm.
1 example, Endeavor Strait. December 23, 1908. Length, 48 mm.
3 examples, Endeavor Strait. December 24, 1908. Length, 35 to 48 mm.
2 examples, Endeavor Strait, beach at village near Chase Head, Palawan. December 22, 1908. Length, 61 to 62 mm.
2 examples, Malapascua Island. March 16, 1909. Length, 75 to 78 mm.
7 examples, Mantacao Island, west coast of Bohol. April 8, 1908. Length, 46 to 64 mm.
1 example, Masamat Bay, Quinalasag Island. June 12, 1909. Length, 55 mm.
8 examples, Nabatas Point, Samar. July 24, 1909. Length 35 to 56 mm.
1 example, Nato River, Luzon. January 17, 1909. Length, 38 mm.
20801. Nato River tidewater. June 18, 1909. Length, 60 mm.
1 example, Pendek Island. December 15, 1909. Length, 33 mm.
5 examples, Port Dupon, brackish river. March 17, 1909. Length, 62 to 80 mm.
5 examples, Port Jamelo, Luzon. July 13, 1908. Length, 38 to 75 mm.
1 example, Port Matalvi, Luzon. November 23, 1908. Length 50 mm.
8 examples, Port Uson, west of Pinas Island. December 17, 1908. Length, 41 to 47 mm.
6398 B. F. Rasa Island, Mantaquin Bay, Palawan Island. April 1, 1909. Length, 50 to 72 mm.

1 example Usada. March 5, 1908. Length, 62 mm. [D. 5174.] [401.] Black spot on shoulder and in axil of pectoral; light blotch posteriorly in axil of dorsal.

56160 U.S.N.M. Philippines. Philippine Commission. Length, 68 mm.

47636 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 63 mm.

27673 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 112 mm. Type of *Pomacentrus leucosphyrus*.

POMACENTRUS SMITHI, new species

Depth 2⅛ to 2¼; head 3⅛ to 3⅕, width 1⅘ to 2. Snout 3⅖ to 3⅘; eye 2¾ to 3½, greater than snout, 1 to 1⅛ in interorbital; maxillary to eye, or slightly beyond front eye edge in young, 2⅞ to 3 in head; teeth uniserial, compressed, form rather even cutting-edge with ends blunt or truncate; interorbital 2⅞ to 3 in head, broadly convex; preorbital and infraorbitals narrow, not free, edges entire; hind preopercle edge with row of small denticles. Gill rakers 7+13, lanceolate, rather long and slender.

Tubes in lateral line 13 to 15, followed by 4 to 6 irregular pores; pores in straight section 7 to 9 to caudal base and 0 to 2 on latter; 3 scales above lateral line, 9 below, 23 or 24 predorsal slightly forward to nostril though not quite to snout edge; preorbital and infraorbitals scaleless; cheek with 3 rows of scales, of which lowest row smallest and on preopercle flange. Scales with 6 or 7 basal radiating striae; apical denticles 74 to 84, with 1 or 2 series of basal elements transversely; circuli fine.

D. XIII, 12, 1 or 13, 1, thirteenth spine 1⅔ to 2 in head, fourth ray 1⅖ to 1⅗; A. II, 13, 1, second spine 1¾ to 2, fourth spine 1⅗ to 1⅔; caudal emarginate, lobes rather pointed, 1$\frac{1}{10}$ to 1⅛; least depth of caudal peduncle 2⅛ to 2⅕ in head; pectoral 1; ventral 1.

Deep brown generally, scales with vertical dusky streaks or bar basally. Head little paler below than above, also breast and belly, all sprinkled with obscure dusky dots producing soiled appearance. Several oblique whitish streaks with blackish-brown alternating irregular streaks, on opercles and humeral region. Also similar horizontal blackish-brown alternating streaks on caudal peduncle out on caudal base. Dorsals largely dusky-black, spinous fin with longitudinal grayish median band and soft fin with pale or grayish streak on each membrane. Anal dusky-black, with 3 longitudinal grayish or whitish bands, uppermost at bases of last rays. Caudal brownish terminally. Paired fins pale brown, pectoral with dusky obscure blotch at origin and ends of ventrals dusky.

Philippines and East Indies. A very distinct species, with dark and light blotches on the opercle and humeral region and the dark bands longitudinally at the caudal base.

Type.—Cat. No. 89958, U.S.N.M.

22 examples, Biri Channel, Balicuatro Island. June 1 and 2, 1909. [1574.] Length 44 to 67 mm. Type and paratype. Black, except four half bars of white or silvery extending from belly; first on chin to eye; second across front of breast and upward on side of head to above upper level of eye and behind it; third including hind portion of breast and merging into fourth, which covers abdomen, latter pointing upward to about upper level of eye behind pectoral; third passing in front of pectoral across tip of opercle and adjacent opening to lateral line; paired fins dusky, verticals somewhat darker than body; fish fades to steely or slaty gray.

3 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 67 to 72 mm.

1 example, Cataingan Bay. April 17, 1908. Length 60 mm.

24 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 40 to 64 mm.

1 example, Isabel, Basilan. September 11, 1909. Length, 40 mm.

1 example, Labuan Blanda Island. December 14, 1909. Length, 83 mm.

10 examples, Mantacao Island, west coast of Bohol. April 8, 1908. Length, 38 to 60 mm.

2 examples, Pangasinan Island, February 13, 1908. Length, 43 to 58 mm.

2 examples, Pendek Island. December 15, 1909. Length, 53 to 58 mm.

1 example, Rasa Island, Mantaquin Bay, Palawan Island. April 1, 1908. Length, 47 mm.

1 example, Romblon. March 26, 1908. Length, 48 mm.

1 example, Sablayan, Mindoro. December 12, 1908. Length, 58 mm.

1 example, Tara Island. December 15, 1909. Length, 65 mm.

1 example, Tataan Island, Tawi Tawi Group. February 20, 1908. Length, 63 mm.

4 examples, Togian Bay, Togian Island. November 9, 1909. Length, 40 to 62 mm.

2 examples, Togian Bay. November 19, 1909.

3 examples, Gane Road, Gilolo Island. December 1, 1909. Length, 47 to 55 mm.

(For Dr. Hugh M. Smith, in slight appreciation of his interest in Philippine Ichthyology.)

POMACENTRUS LITTORALIS Cuvier

Pomacentrus littoralis (Kuhl and Van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 425, Java.—Schlegel and Müller, Verh. Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 20, pl. 4, fig. 3 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 32 (Amboyna, Dove's Island in Queensland, Port Essington, East Indies).—Castelnau, (Res. F. Austral.), Victor. Off. Rec. Phila. Exhib., 1875, p. 34 (Cape York).—Peters, Monatsb. Akad. Wiss. Berlin, 1816, p. 442 (Mauritius).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 342 (Cape Grenville and Palm Islands).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 8.—Day, Fishes of India, pt. 3, 1877, p. 383.—Klunzinger, Sitzs. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 397 (Port Darwin).—Macleay, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 62 (Endeavor River).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (North Celebes).—Day, Fauna British India, vol. 2, 1889, p. 384.—Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 426, pl. 46, fig. 2.—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 89 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Cavite).

Pomacentrus (*Pseudopomacentrus*) *littoralis* BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 53 (Sumatra, Java, Bali, Celebes, Sangi, Flores, Solor, Timor, Buru, Amboina).

Pomacentrus hogoleuensis HOMBRON and JACQUINOT, Voy. Astrolabe, Zool., vol. 3, 1853, p. 47, pl. 5, fig. 3. Hogoleu, Carolines.

Pomacentrus moluccensis BLEEKER, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 118. Amboyna and Ternate.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 30 (East Indies).—BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 302, (3), fig. 3.—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 89 (Bacon).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 127 (Amboina).

Pomacentrus (*Pseudopomacentrus*) *moluccensis* BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 56 (Batu, Singapore, Java, Bawean, Celebes, Solor, Timor, Ternate, Amboina, Ceram, Buru, Goram, New Guinea).

Pomacentrus popei EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 90, fig. 16. Bacon.

Pomacentrus hebardi FOWLER, Proc. Acad. Nat. Sci., Phila., 1918, p. 46, fig. 18. Philippines.

Pomacentrus burroughi FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 48, fig. 19. Philippines.

Depth 1⅞ to 2; head 3 to 3⅕, width 1⅗ to 1⅞. Snout 3 to 3⅛; eye 3⅛ to 4, 1 to 1⅛ in snout, 1 to 1⅛ in interorbital; maxillary reaches eye, 3⅖ to 3½ in head; teeth uniserial, compressed, truncate, form close set cutting edge; interorbital broadly convex, 3⅛ in head; infraorbital and hind preopercle edge coarsely denticulate. Gill rakers 8+13, lanceolate, rather robust, short.

Tubes in lateral line 16 to 18, pores in straight section 7 or 8+1 to 3; 3 or 4 scales above lateral line, 9 or 10 below, 20 to 22 predorsal; 3 rows of cheek scales, none on infraorbital or preopercle flange. Scales with 7 to 9 basal radiating striae; apical denticles 113 to 182, with 1 to 4 transverse series of basal elements; circuli very fine.

D. XIII or XIV, 14, 1 or 15, 1, fourteenth spine 1⅗ to 1⅔ in head, seventh ray 1⅕ to 1¼; A. II, 15, 1, second spine 1⅗ to 2, eighth ray 1¼ to 1½; caudal 1 to 1⅛, emarginate lobes rounded; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1¼; ventral 1 in head or 3 in combined head and body.

Uniform dusky brown, fins all inclining to darker or blackish. Upper scale of opercle, at beginning of lateral line, blackish, though spot smaller than pupil. Iris dusky.

Mauritius to the East Indies and Oceania. Among the uniformly dark species this may be known by the few more dorsal spines, 13 or 14 as compared with the usual 12 in *Pomacentrus nigricans* and *P. lividus*. Structurally it is subject to considerable variation, though in color pattern always of a general dark uniform shade.

791. 1 example, Agojo Point, Cataingan Island. June 10, 1909. Length, 88 mm. 1 example, Alimango Bay, Burias Island. March 5, 1909. Length, 75 mm.

9 examples, Bolalo Bay, Palawan Island. December 21, 1909. Length, 50 to 120 mm.
3 examples, Batan Island. June 5, 1909. Length, 69 to 82 mm.
14918. Biri Channel. June 2, 1909. Length, 60 to 77 mm. 2 examples.
2 examples, Buang Bay, Talajit Island. Length, 130 to 139 mm. March 15, 1909.
2 examples, Bubuan Island, Jolo. February 14, 1908. Length, 65 to 69 mm.
3 examples, Bugsuk Island, Balabac. January 5, 1909. Length. 68 to 77 mm.
3 examples, Bumbum Island. September 25, 1909. Length, 75 to 80 mm.
9 examples, Burias Island. March 7, 1909.
319, 320, 3221. Busin Harbor, Burias Island. March 8, 1909. 12 examples. Length, 56 to 97 mm.
20590, 20591, 20592. Busin Harbor. April 23, 1908. Length, 83 to 90 mm.
7 examples, Busin Harbor. June 2, 1909. Length, 61 to 88 mm.
21698. Cabugao Bay, Catanduanes Island. June 9, 1909. Length, 87 mm.
22589 and 22599. Caiholo River, Palawan. December 29, 1908. Length, 72 to 87 mm.
7 examples. Candaraman Island, Balabac. January 4, 1909. Length, 61 to 84 mm.
6 examples, Canimo, near Daet. June 15, 1909. Length, 105 to 120 mm.
2 examples. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 63 to 84 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 77 mm.
1 example, Casogoran, Malhon Island. July 27, 1909. Length, 83 mm.
1 example, Cataingan Bay, Masbate Island. November 14, 1909. Length, 56 mm.
10 examples, Catbalogan, Samar. April 14, 1908. Length, 100 to 127 mm.
1 example, Catbalogan. April 16, 1908. Length, 95 mm.
21855. Canmahala Bay, Ragay Gulf, in small stream. March 11, 1909. Length, 100 mm.
1 example, Cuyo, Cuyo Island. April 9, 1909. Length, 76 mm.
1 example, Daisy Island, west of Bumbum. January 6, 1910. Length, 88 mm.
22348. Dampali, near Malabon. August 10, 1908. Length, 79 mm.
1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 65 mm.
14276 to 14283. Endeavor Strait. December 22, 1908. Length, 60 to 82 mm.
73, 75, 77, 80, 88, 90, 105, 107, 108, 116, 117, 119. Endeavor Strait. December 23, 1908. Length, 61 to 83 mm.
7284. Gigoso Point, Samar. July 28, 1909. Length, 85 mm.
1 example, Gomomo Island. December 3, 1909. Length, 106 mm.
3 examples, Grande Island Reef. January 8, 1908. Length, 64 to 108 mm.
5 examples, Great Tobea Island. December 15, 1909. Length, 74 to 83 mm.
1 example, Guiniyan Island. June 4, 1909. Length, 80 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 70 mm.
7 examples, Jolo. March 6–7, 1908. Length, 68 to 80 mm. [408.] Like 411, but without black on anal. [409.] Like 411, but caudal somewhat lighter and black on anal much less distinct. [410.] With black or blue blotch on the upper corner of opercle, and another at upper base of pectoral; fins yellowish; ocellus at posterior of soft dorsal, and a dark blotch at upper edge of caudal peduncle. [411.] Slaty; tail lighter; anal with black edge and blackish blotch posteriorly; distinct black spot on upper corner of opercle; caudal slightly paler than rest of body.
14685. Langao Point, Luzon. June 24, 1909. Length, 75 mm.

1 example, Limbones Cove. February 8, 1909. Length, 63 mm.
14817, 14824, 14828. Little Santa Cruz Island. May 26, 1908. Length, 66 to 98 mm. 4 examples.
4 examples, Little Santa Cruz Island. May 28, 1908. Length, 66 to 98 mm.
2 examples, Mactan Cove, Mactan Island. April 6, 1908. Length, 75 to 85 mm.
5 examples, Maculabo Island. June 4, 1909. Length, 68 to 80 mm.
22047. Maganak, Lagonoy Gulf, Luzon. June 17, 1909. Length, 77 mm.
21621. Makesi Island, Palawan. April 5, 1909. Length, 73 to 87 mm.
20851 and 20852. Mansalay Island, Mindoro. June 4, 1908. 5 examples. Length, 50 to 88 mm.
1 example, Masamat Bay, Quinalasag Island. June 12, 1909. Length, 72 mm.
3 examples, Mompog Island. March 3, 1909. Length, 69 to 76 mm.
14 examples, Nabatas Point, Samar Island. July 24, 1909. Length, 73 to 120 mm.
7 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 64 to 95 mm.
1 example, Pagapas Bay, Luzon. February 26, 1909. Length, 73 mm.
20294. Palag Bay vicinity, Luzon. June 16, 1909. Length, 95 mm.
4 examples, Pandanon Island. March 23, 1909. Length, 75 to 85 mm.
12 examples, Pangasinan Island. February 13, 1908. Length, 38 to 69 mm.
1 example, Porongpong Island, Palumbanes Group. June 11, 1909. Length, 72 mm.
1 example, Powati Harbor, Makyan Island. November 28, 1909. Length, 80 mm.
1 example, Polloc, Mindanao. May 22, 1908. Length, 60 ? mm.
1 example, Port Binanga. January 9, 1908. Length, 58 mm.
21640. Port Jamelo, Luzon. July 13, 1908. Length, 88 mm.
57. Port Langcan, Palawan Island. April 8, 1909. Length, 77 mm.
2 examples, Port Matalvi, Luzon. November 22, 1908. Length, 74 to 75 mm.
31 examples, Port Matalvi. November 23, 1908. Length, 40 to 88 mm.
14589. Port Palapag. June 3, 1909. Length, 62 to 71 mm. 4 examples.
7 examples, Port Uson, west of Pinas Island. December 17, 1908. Length, 71 to 78 mm.
20929 and 20932. Puerta Princesa, Palawan. April 5, 1909. Length, 67 to 70 mm.
7 examples, Pujada Bay, Mindanao. May 5, 1908. Length, 68 to 85 mm.
1 example, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 81 mm.
3 examples, Rapu Rapu Island. June 22, 1909. Length, 54 to 78 mm.
6 examples, Romblon. March 26, 1908. Length, 47 to 86 mm.
2 examples, Romblon Harbor. March 25, 1908. Length, 76 to 77 mm. [444 and 464.]
1 example, Romblon Reef. March 26, 1909. Length, 96 mm.
2 examples, Sacol Island. September 9, 1909. Length, 80 to 82 mm.
2 examples, San Miguel Harbor, Ticao Island. April 2, 1908. Length, 83 to 85 mm.
10922. San Miguel Harbor. April 21, 1908. Length, 85 mm. 3 examples.
19676 and 19677. Santa Cruz, Marinduque Island. April 24, 1908. 5 examples. Length, 70 to 89 mm.
20938, 20939, 21234, 22893, 22894, Surigao, Mindanao. May 5, 1908. Length, 62 to 86 mm.
1 example, Taganak Island. January 7, 1909. Length, 58 mm.
1 example, Tanakeke Island. December 21, 1909. Length, 74 mm.
1 example, Tara Island. December 14, 1908. Length, 74 mm.

5 examples, Tara Island. December 15, 1908. Length, 85 to 95 mm. [791.] Olive-brown, with more or less purplish shade; posterior regions with orange; peduncle and caudal fin bright orange, tip of fin dusky; no orange on dorsal or anal; paired fins, dorsal and anal blackish; axil of pectoral bright orange; iris purplish; below purplish shades on side of head.

4 examples, Tara Island. December 15, 1908. Length, 76 to 99 mm. [792.] Almost uniform blackish-brown; no markings apparent except small black blotch at upper angle of opercle, and in one specimen umber blotch under middle of soft dorsal and another at axil.

1 example, Tataan Island, Simaluc. February 18, 1908. Length, 50 mm.

4 examples, Tataan Bay, Simaluc Island. February 20, 1908. Length, 49 to 85 mm. [170.] Grass-green, becoming olive on back and sulphur-yellow on belly; abundantly dotted with light purple specks, these tending to form lines on extreme lower side; dusky stripe through eye and front of nose, ending as black stripe at upper corner of opercle; dorsal body-color at base, tips of spinous portion olive, median region barred with irregular dashes of citron-yellow; soft portion pale olive, rays with yellow lines; caudal olive-gray distally, with cadmium shades at base; anal cadmium, spine tipped with olive; ventral sulphur-yellow; pectoral hyaline, with dusky at tips; iris dark green, with purple shades.

5 examples, Togian Bay, Togian Island. November 19, 1909. Length, 41 to 78 mm.

1 example, Tumindao Island. February 26, 1908. [322.]

14529. Ulugan Bay, Rita Island. December 29, 1908. Length, 80 mm.

3 examples, Ulugan Bay, Channel north of Oyster Inlet. December 28, 1908. Length, 90 to 98 mm.

4 examples, Varadero Bay, Mindoro. July 23, 1909. Length, 67 to 97 mm.

1 example. Length, 70 mm. [323.]

12918. Buka Buka Island, Celebes. November 20, 1909. Length, 83 mm.

21403. Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 82 mm.

22431. Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 85 mm.

55903 U.S.N.M. Bacon. Length, 59 mm. Type of *Pomacentrus popei.* This shows a very faint trace of dark spot at beginning of lateral line and another at pectoral origin.

56002 U.S.N.M. Luzon. Length, 100 mm.

56188 U.S.N.M. Luzon. Length, 64 mm. As *Abudefduf glaucus.*

56231 U.S.N.M. Luzon. Length, 68 mm. As *Pomacentrus moluccensis.*

47519 to 47525 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Type and paratypes of *Pomacentrus hebardi.*

47526 and 47527 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Type and paratype of *P. burroughi.*

POMACENTRUS MELANOPTERUS Bleeker

Pomacentrus melanopterus Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 562. Amboina.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 24 (East Indies).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 402 (3), fig. 6.—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 504 (Okinawa).

Pomacentrus (*Pseudopomacentrus*) *melanopterus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 55 (Java, Bawean, Bali, Flores, Buru, Amboina, Ceram, New Guinea).

Pomacentrus brachialis (not Schlegel and Müller) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 420 (Java).

Pomacentrus ater LIÉNARD, Dix Rap. Soc. Hist. Nat. Maurice, 1839, p. 34. Mauritius.—SAUVAGE, Hist. Nat. Madagascar, Poiss., 1891, p. 428 (on LIÉNARD).

Eupomacentrus ater BLEEKER, Verh. Akad. Amsterdam, vol. 18, No. 3, 1879, p. (2) 5, fig. Mauritius.

Pomacentrus megalops LIÉNARD, Dix Rep. Soc. Hist. Nat. Maurice, 1839, p. 34 (Mauritius).—SAUVAGE, Hist. Nat. Madagascar, Poiss., 1891, p. 426 (on LIÉNARD).

Pomacentrus analis MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 364. New Guinea.

Pomacentrus alexanderae EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 90, fig. 17. Bacon.

Promacentrus nigromanus WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 338, fig. 72. Amboina.

Pomacentrus violescens (not BLEEKER) FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 43 (Philippines).—FOWLER, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 1⅞ to 2⅛; head 3⅕ to 3⅓, width 1⅝ to 1¾. Snout 3⅞ to 4; eye 2⅖ to 3¼, greater than snout, 1⅕ in interorbital, greater than interorbital in young; maxillary nearly or quite reaches eye, 3½ to 3⅗ in head; teeth uniserial, compressed, ends slightly rounded; interorbital 3 to 3⅛, broadly convex; infraorbital edge with denticle anteriorly and otherwise uneven or rough, or denticles very few; hind preopercle edge feebly denticulate. Gill rakers 8+15, lanceolate, rather long.

Tubes in lateral line 16 or 17, pores in straight section 7 or 8+1 or 2; 4 scales above lateral line, 9 below, 21 or 22 predorsal scales; 3 rows of cheek scales, none on infraorbital. Scales with 6 to 8 basal radiating striae; apical denticles 94 to 140, with 3 to 7 transverse series of basal elements; circuli very fine.

D. XIII, 11, 1 or 12, 1, thirteenth spine 1⅖ to 1⅗ in head, fourth ray 1⅛ to 1⅓; A. II, 14, 1, second spine 1⅖ to 1⅔, sixth ray 1¼; caudal peduncle depth 1⅞ to 2; caudal 3⅕ to 3¼ in combined head and body; pectoral 3⅛ to 3⅓; ventral 3¼ to 3⅖.

Back dark umber to dusky brown, paler below or light brown, sometimes whitish on under surface of head, breast, and belly. Iris silvery white to brown or even dusky. Many examples are uniformly dark or dusky brown and the fins blackish. Usually in paler forms spinous dorsal dusky and all along upper edge of soft dorsal, also lower anal edge. Many have paler caudal fins, gray to light brown. Often paired fins pale or transparent or ventrals blackish, but pectoral base always with a large blackish blotch, well defined and axil of fin also black.

Mauritius to East Indies and Okinawa. The most abundant species of pomacentrid in our collections and very variable as to shade of color. Dark or melanistic examples occur in equal abundance with the pale forms. They are also found associated with a score or more

species, according to our lots. There are certainly no constant characters to sharply define the various shades of color. The extremes are very contrasted, however, and easily suggest allied species, though the large black sharply-defined pectoral blotch is ever constant.

An extremely interesting specimen is one from Gane Road, Gillolo Island, which differs as a very aberrant color variety. In general it is brown, paler below and inclining to very light brown or even whitish on soft dorsal, caudal, and base of anal. A few pale grayish spots on scales on cheek and opercles. Spinous dorsal anteriorly and lower half of anal dusky, also pectoral base. This is the *Pomacentrus nigromanus* Weber, except that he does not mention the spots on the side of the head.

12 examples, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 53 to 90 mm.

11203, 13721 to 13723, 13725 to 13727, 14890. Alimango Bay, Burias Island. March 5, 1909. 11 examples. Length, 70 to 88 mm.

3 examples, Bagacay Bay, Escarpada Island, Naranjos Group. March 13, 1909. Length, 80 to 83 mm.

4 examples, Balikias Bay, Lubang Island. July 17, 1908. Length, 80 to 90 mm.

10 examples, Batan Island. June 5, 1909. Length, 73 to 83 mm.

11 examples, Butauanan Island. June 13, 1909. Length, 59 to 99 mm.

12 examples, Biri Channel. June 1, 1909. Length, 70 to 100 mm.

14914, 9932. Biri Channel. June 2, 1909. 4 examples. Length, 70 to 100 mm.

9 examples, Bolalo Bay, Palawan Island. December 21, 1908. Length, 52 to 80 mm.

1 example, Bolinao Bay. May 10, 1909. Length, 69 mm.

3 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 94 to 96 mm.

3 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 53 to 67 mm.

5 examples, Bumbum Island. September 25, 1909. Length, 73 to 79 mm.

11 examples, Burias Island, Alimango Bay. March 5, 1909. Length, 60 to 85 mm.

10 examples, Busin Harbor, Burias Island. March 7, 1909. Length, 35 to 73 mm.

12 examples, Busin Harbor. March 8, 1909. Length, 48 to 75 mm.

6 examples, Busin Harbor. April 22, 1908. Length, 68 to 85 mm.

35 examples, Busin Harbor. June 2, 1909. Length, 54 to 82 mm.

5 examples, Cagayan. January 8, 1909. Length, 70 to 73 mm.

1 example, Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 91 mm.

14 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 45 to 90 mm.

9 examples, Candaraman Island, Balabac. January 4, 1909. Length, 68 to 88 mm.

2 examples, Canimo Island, near Daet. June 15, 1909. Length, 95 to 103 mm.

1 example, Canimo Island, near Daet. June 15, 1909. Length, 68 mm.

12739 and 12740. Capulaan Bay, Pagbilao Island. February 24, 1909. 11 examples. Length, 43 to 88 mm.

5 examples, Capunuypugan, Mindanao, May 9, 1908. Length, 75 to 86 mm.

17 examples, Capunuypugan. May 10, 1908. Length, 50 to 100 mm.

25 examples, Caracaran, Batan Island. June 8, 1909. Length, 45 to 85 mm.

4 examples, Cataingan Bay, Masbate Island. November 14, 1909. Length, 65 to 84 mm.

2 examples, Caxisigan Island. January 2, 1909. Length, 79 to 89 mm.
22836 and 22837. Daisy Island, west of Bumbum. January 6, 1909. 5 examples. Length, 62 to 80 mm.
2 examples, Dalaganem Island. April 8, 1909. Length, 82 mm.
2 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 85 to 87 mm.
12 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 60 to 89 mm.
13230 and 13618. Doworra Island. December 2, 1909. 7 examples. Length, 40 to 76 mm.
10430. East side Verde Island. July 22, 1908. Length, 82 mm.
2 examples, Endeavor Strait, beach at village near Chase Head, Palawan Island. December 22, 1908. Length, 57 to 58 mm.
1 example, Endeavor Strait, Palawan Island. December 22, 1908. Length, 84 mm.
84, 92 to 94, 114. Endeavor Strait. December 23, 1908. 10 examples. Length, 55 to 75 mm.
5 examples, Galera Bay, Mindoro. June 9, 1908. Length, 79 to 97 mm.
1 example, Gomomo Island. December 3, 1909. Length, 88 mm.
1 example, Gondra Island. September 20, 1909. Length, 87 mm.
7 examples, Grande Island reef. January 8, 1908. Length, 80 to 95 mm.
3 examples, Great Tobea Island. December 15, 1909. Length, 69 to 78 mm.
18 examples, Guntao Island. December 20, 1908. Length, 80 to 94 mm.
9907, 9908, 11092, 11093. Inamucan Bay, Mindanao. August 8, 1909. 6 examples. Length, 66 to 93 mm.
4 examples, Inamucan Bay. August 9, 1909. Length, 85 to 90 mm.
2 examples, Kayoa Island. November 29, 1909. Length, 66 to 70 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 88 mm.
150. Langao Point, Luzon. June 24, 1909. Length, 85 mm.
17837. Langao Point. Luzon. June 24, 1909. 10 examples. Length, 58 to 88 mm.
3 examples, Ligpo Point, Balayan Bay, Luzon. January 18, 1908.
4 examples, Ligpo Point. Length, 75 to 84 mm.
4 examples, Limbones Cove. February 8, 1909. Length, 85 to 90 mm. [1127.]
13926. Lampinigan Island. September 11, 1909. Length, 93 mm.
3 examples, Little Santa Cruz Island. May 28, 1908. Length, 65 to 78 mm.
12 examples, Mactan Island. March 25, 1909. Length, 75 to 95 mm.
6 examples, Maculabo Island. June 14, 1909. Length, 60 to 80 mm.
1 example, Maitara Island. November 26, 1909. Length, 68 mm.
20786 and 13842. Makyan Island, Powati Harbor. 4 examples. November 28, 1909. Length, 58 to 86 mm. [2075.] Slaty, darkest above, posterior regions becoming sulphur-yellow. Spinous dorsal membrane slaty, on first to third sulphur, behind margins narrow, black line; soft dorsal sulphur with some dusky and dusky at tip; caudal sulphur, black at tip; pectoral dusky, with black blotch at base; ventral pale slaty-gray, with slight sulphur tinge; anal sulphur, with dusky, narrow line of black at margin. [2077.] Slaty-black, soft fins and ventrals darkest and black blotch at pectoral base.
6 examples, Makyan Island. November 29, 1909. Length, 68 to 87 mm.
28, 30, 32. Malapascua Island. March 16, 1909. 9 examples. Length, 64 to 98 mm.
8 examples, Mansalay Island. June 4, 1908. Length, 67 to 93 mm.
13 examples, Mantacao Island, west coast of Bohol. April 8, 1908. Length, 53 to 83 mm.

8 examples, Maribojoc, Bay, Maribojoc, Bohol. March 26, 1909. Length, 80 mm.
9 examples, Masamat Bay, Quinalasag Island. June 12, 1909. Length, 66 to 87 mm.
14703 and 14706. Matnog Bay. May 31, 1909. Length, 85 to 94 mm.
3 examples, Mompog Island. March 3, 1909. Length, 89 to 97 mm.
7 examples, Murcielagos Bay, Mindanao. August 9, 1909. Length, 73 to 88 mm.
2 examples, Murcielagos Bay. August 21, 1909. Length, 80 to 85 mm.
6 examples, Nabatas Point, Samar. July 24, 1909. Length, 70 to 84 mm.
4 examples, Northwest Verde Island. July 22, 1908. Length, 78 to 90 mm.
19 examples, Opol, Mindanao. August 4, 1909. Length, 56 to 92 mm.
7 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 63 to 85 mm.
5 examples, Pagapas Bay, Luzon. February 26, 1909. Length, 80 to 87 mm.
11414, 11417, 11418. Paluan Bay, Mindoro. December 11, 1908. Length, 84 to 93 mm.
1 example, Pandanon Island. March 23, 1909. Length, 72 mm.
5 examples, Pangasinan Island. February 13, 1908. Length, 58 to 71 mm.
14363. Paron Point, Albay Gulf, Luzon. 10 examples. June 21, 1909. Length, 63 to 86 mm.
4 examples, Pasacao, Ragay Gulf. March 9, 1909. Length, 60 to 94 mm.
1 example, Panpan, Tara Island. September 20, 1909. Length, 79 mm.
3 examples, Panpan. September 30, 1909. Length, 70 to 87 mm.
1 example, Pendek Island. December 15, 1909. Length, 73 mm.
11 examples, Philippines. Length, 55 to 92 mm.
13139. Polloc, Mindanao. May 22, 1908. 11 examples. Length, 70 to 88 mm.
1 example, Port Banalacan, Marinduque. February 23, 1909. Length, 78 mm.
22562 and 22563. Port Binanga. January 9, 1908. 4 examples. Length, 69 to 87 mm.
1 example, Port Caltom. December 15, 1908. Length 90 mm.
15121, 15131, 15135. Port Dupon, Leyte Island. March 17, 1909. Length, 71 to 87 mm.
9 examples, Port Galera, Mindoro. June 9, 1908. Length, 72 to 98 mm.
19960 Port Galera, Mindoro. October 27, 1909. Length, 90 mm.
9 examples, Port Jamelo, Luzon. July 13, 1908. Length, 72 to 90 mm.
10315 and 10317. Port Maricaban. July 21, 1908. 18 examples. Length, 60 to 95 mm.
16536. Port Matalvi, Luzon. November 22, 1908. 9 examples. Length, 40 to 83 mm.
13370. Port Matalvi. November 23, 1908. 13 examples. Length, 43 to 79 mm.
2 examples, Port Palapag. June 2, 1909. Length, 58 to 70 mm.
13 examples, Port Palapag. June 3, 1909. Length, 33 to 78 mm.
3 examples, Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 85 to 104 mm.
1 example, Port San Pio Quinto. November 11, 1908. Length, 98 mm.
5 examples, Port Uson west of Pinas Island. December 17, 1908. Length, 65 to 77 mm.
7 examples, Pujada Bay, East Mindanao. May 15, 1908. Length, 72 to 93 mm.
1 example, Quinalasag Island, Masamat Bay. June 12, 1909. Length 84 mm.
1 example, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 39 mm.
9 examples, Rapu Rapu Island. June 22, 1909. Length, 72 to 88 mm.
4 examples, Rasa Island, Mantaquin Bay, Palawan. April, 1909. Length, 53 to 59 mm.

6399. Rasa Island. April 1, 1909. 2 examples. Length, 58 to 70 mm.

14976. Refugio Island, Pasacao, Luzon. March 9, 1909. Length, 87 mm. [1270.] Smoky purplish olive anteriorly, merging into yellowish posteriorly; unscaled dorsal lemon-yellow, covering also scaled part of soft dorsal; tips of spinous membranes blackish; soft verticals dusky yellow; paired fins dusky, large black blotch at base of pectoral.

18 examples, Romblon. March 26, 1908. Length, 70 to 89 mm.

14671. Romblon. March 26, 1908. Length, 78 mm. [225.] Pale olive green, top of head and back darker. Dorsal body-color, incised tips of spinous membrane black with paler just beneath; soft dorsal dusky; caudal same; anal similar to soft dorsal, terminal portion darker. Ventral and pectoral dusky, latter with dark blotch on base and axil nearly large as eye. Iris silvery.

20 examples, Romblon Harbor, Romblon Island. March 25, 1908. Length, 55 to 83 mm. Dusky-green on back and upper side, becoming dusky pearl-gray below. All fins similar to body. Pectoral pale, base black, bordered all around with dusky. [460 and 461.]

14762. Romblon Reef. March 26, 1909. 7 examples. Length, 72 to 85 mm.

14791. Sablayan, Mindoro. December 12, 1908. Length, 90 mm.

6 examples, Sablayan, Mindoro. December 13, 1908. Length, 80 to 93 mm.

5 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 70 to 84 mm.

1 example, San Roque, Leyte. July 29, 1909. Length, 76 mm.

3 examples, Santa Cruz, Marinduque. April 24, 1908. Length, 55 to 82 mm.

12221 and 12222. 3 examples, Santa Cruz Island, Marinduque. April 24, 1908. Length 63 to 88 mm.

16 examples, Simaluc Island. September 22, 1909. Length, 49 to 82 mm.

5 examples, Simaluc Island. September 23, 1909. Length, 64 to 85 mm.

1 example, Sitanki Reef. September 24, 1909. Length, 80 mm.

1 example, Singaan Island. September 21, 1909. Length, 85 mm.

3 examples, Sulade Island. September 17, 1909. Length, 83 to 87 mm.

3 examples, Surigao, Mindanao. May 8, 1908. Length, 62 to 78 mm.

1 example, Taganak Island. January 7, 1909. Length, 77 mm.

20708. Tambul Sigumbul, Tonquil Island. September 14, 1909. Length, 69 mm.

11 examples, Tapiantana Island. September 19, 1909. Length 62 to 86 mm.

7 examples, Tara Island. December 14, 1908. Length, 57 to 92 mm.

1 example, Tara Island. December 15, 1908. Length 80 mm. [793.] Slaty black; caudal peduncle with orange shades; vertical edge of dorsal and anal, and caudal fin bright orange; base of pectoral black, near portion of axil yellow.

11 examples, Tara Island. December 15, 1908. Length, 62 to 90 mm. [805, 784.] Uniform pale slaty, with vertical fins posteriorly black; pronounced black blotch on pectoral base.

21 examples, Tataan Island. February 2, 1908. Length, 63 to 92 mm.

14672, 14673, 14674. Tataan Island. February 20, 1908. Length, 73 to 85 mm. [227, 223.]

10397. Tilig. July 14, 1908. Length, 37 mm.

8 examples, Tilig, Lubang Islands. July 14, 1908. Length, 62 to 83 mm.

1 example, Togian Bay, Togian Island. November 19, 1909. Length, 63 mm.

1 example, Tomahu Island. December 11, 1909. Length, 78 mm.

1 example, Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 67 mm.

2 examples, Tumindao Bay, reefs south lagoon. February 26, 1908. Length, 75 to 77 mm.

5 examples, Tutu Bay, first Anchorage, Jolo. September 19, 1909. Length, 66 to 83 mm.

15424 and 15425. Ulugan Bay, Rita Island. December 29, 1908. Length, 58 to 64 mm.

2 examples, Varadero Bay, Mindoro. July 23, 1909. Length, 94 mm.

19047, 19048, 19087. Varadero Bay. July 23, 1908. Length, 83 to 89 mm.

2 examples, Uki, Bouro Island. December 9, 1909. Length, 55 to 58 mm.

31 examples, Basa Reef, Gulf of Boni, Celebes, East Indies. December 17, 1909. Length, 53 to 90 mm.

11047. Cape Kait, Libani Bay, Celebes. December 29, 1909. 3 examples. Length, 55 to 78 mm.

14858 and 14860. Dodepo and Pasejogo Islands, Celebes. November 19, 1909. 6 examples. Length, 72 to 87 mm.

11 examples, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 63 to 95 mm.

13465. Limbe Strait, Celebes. November 9, 1909. Length, 92 mm.

12773, 12775, 12777, 13662. Limbe Strait. November 10, 1909. Length, 38 to 100 mm. 4 examples.

1 example, Togian Bay, Togian Island, Gulf of Tomini, Celebes. November 9, 1909.

13643. Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 18, 1909. Length, 88 mm.

21402. Gane Road, Gillolo Island, Moluccas. December 1, 1909. 13 examples. Length, 60 to 85 mm.

4 examples, Tidore Island, South of Ternate. November 24, 1909. Length, 73 to 103 mm.

7 examples, Tidore Island. November 25, 1909. Length, 67 to 94 mm.

11167, 11170, 11172, 11173. Nan Wan Bay, Formosa. January 25, 1910. Length, 75 to 87 mm.

52206 U.S.N.M. Samoa. Bureau of Fisheries. Length, 98 mm.

52305 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 52 to 80 mm. 5 examples.

55919 U.S.N.M. Bacon. Philippine Commission. Type of *Pomacentrus alexanderae.*

55922 U.S.N.M. Bacon. Philippine Commission. Paratype of *Pomacentrus alexanderae.*

71600 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 105 mm. 1 example.

48721 to 48724 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 63 to 88 mm. As *Pomacentrus violescens.*

51176 A.N.S.P. Pago Pago. Capt. C. F. Silvester. Length, 85 mm.

33296 A.N.S.P. Bacon. Paratype of *Pomacentrus alexanderae.*

POMACENTRUS AMBOINENSIS Bleeker

Pomacentrus amboinensis Bleeker, Versl. Kon. Akad. Wet., ser. 2, vol. 2, 1868, p. 334. Amboina; Atlas Ich. Ind. Neerl., vol. 9, 1877, p. 58, pl. 406 (7), fig. 67.—Steindachner, Abhandl. Senckenberg. Ges., vol. 25, 1900, p. 440 (Ternate).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, 1913, p. 127 (Ambon).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 339 (Banda).

Pomacentrus (*Pseudopomacentrus*) *amboinensis* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 58 (Amboina).

Depth 2 to 2⅛; head 3 1/10 to 3¼, width 1¾ to 1⅞. Snout 3⅖ to 4⅛; eye 2⅘ to 3⅙, little greater than snout and about equals

interorbital in adult, much greater in young; maxillary reaches opposite eye, 3 to 3⅕ in head; interorbital 2⅞ to 3⅕, broadly convex; serrae coarse on infraorbital and preopercle edges, large anteriorly on former. Gill rakers 10+16, slender, lanceolate, rather long.

Tubes in lateral line 16 to 18, pores in straight section 7 or 8+2 or 3; 4 scales above lateral line, 9 below, 18 to 21 predorsal; 3 rows of cheek scales, none on infraorbital. Scales with 8 or 9 basal radiating striae; apical denticles 109 to 113, basal elements in 1 or 2 transverse rows; circuli very fine.

D. XIII, 14, 1 or 15, 1, thirteenth spine 1⅗ to 1⅔ in head, seventh ray 1⅕ to 1⅓, first ray sometimes simple; A. II, 15, 1, second spine 1⅗ to 1¾, tenth ray 1¼ to 1⅓, first and second rays often simple; caudal deeply emarginate, 3 to 3⅛ in combined head and body; ventral 2¾ to 2⅞; pectoral 1 to 1⅛ in head; least depth of caudal peduncle 2.

Pale brownish, with yellowish shade generally, especially on lower surface of head, breast, belly, and most of fins. Whitish line from side of snout to eye and another all along lower and hind eye edge. Cheek and opercles with large whitish blotches and scales of breast each with small whitish blotch. Small dusky spot on opercle above, at beginning of lateral line. Iris yellowish brown. No spots on head above, predorsal or front of trunk. Rest of trunk all covered with minute whitish dots, also extending over vertical fins thickly; on large body scales often 4 to 6 dots on each one. Spinous dorsal with grayish margin. Anal with 2 longitudinal whitish lines on outer portion. Pectoral fins light yellowish, with dusky blotch at pectoral origin, though little larger than that below suprascapula, not large as pupil.

East Indian region. A handsome showy species, readily known by its light delicate shades. Its pattern of color quite constant. Many examples often have a large black ocellus, variably large or small, about middle of soft dorsal.

2 examples, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 83 to 88 mm.

3 examples, Bagacay Bay, Escarpada Island, Naranjos Group. March 13, 1909. Length, 75 to 98 mm.

12249. Batan Island. June 5, 1909. 5 examples. Length, 68 to 88 mm.

1 example Butauanan Island. June 13, 1909. Length, 82 mm.

11 examples, Biri Channel. June 1, 1909. Length, 57 to 85 mm.

14915 and 14917. Biri Channel. June 2, 1909. 6 examples. Length, 58 to 87 mm.

1 example, Buang Bay, Talajit Island. March 15, 1909. Length, 80 mm.

1 example, Bubuan Island, Jolo. February 14, 1908. Length, 80 mm.

1 example, Bulan Island, Samales Group. September 13, 1909. Length, 87 mm.

306 and 308. Busin Harbor, Burias Island. March 8, 1909. Length, 64 to 72 mm.

1 example, Candaraman Island, Balabac. January 4, 1909. Length, 73 mm.

2 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 70 to 75 mm.

6 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 65 to 84 mm.

1 example, Caxisigan Island. June 2, 1909. Length, 82 mm.

5 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 58 to 78 mm.

13232. Doworra Island. December 2, 1909. 6 examples. Length, 63 to 70 mm.

3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 83 to 100 mm.

3 examples, Gomomo Island. December 3, 1909. Length, 65 to 80 mm.

1 example, Jolo. March 6–7, 1908. Length, 72 mm.

22921. Labuan Blanda Island. December 13, 1909. Length, 66 mm. (Dr. 5640.)

1 example, Labuan Blanda Island. December 14, 1909. Length, 74 mm.

8 examples, Makyan Island. November 29, 1909. Length, 55 to 76 mm.

4 examples, Murcielagos Bay. August 9, 1909. Length, 81 to 103 mm.

1 example, Malcochin Harbor, Port Uson, Linapacan Island. December 19, 1908. [945.] Olive above, with purplish shades, becoming pale below and posteriorly; dorsal similar to body, becoming yellow posteriorly; an opaque bar across spinous portion under incised tips; caudal lemon-yellow, with narrow black tip; anal greenish-yellow, with three or four oblique lilac bars; ventrals and pectorals lemon-yellow; black blotch size of pupil at upper base of pectoral.

2 examples, North West Verde Island. July 22, 1908. Length, 61 to 65 mm.

8 examples, Pangasinan Island. February 13, 1908. Length, 63 to 94 mm.

1 example, Philippines. Length, 77 mm.

2 examples, Port Galera, Mindoro. June 9, 1908. Length, 90 mm.

10304, 10311, 10312, 10508, 10512. Port Maricaban. July 21, 1908. Length, 47 to 94 mm.

20785. Powati Harbor, Makyan Island. November 28, 1909. Length, 68 to 81 mm.

1 example, Pujada Bay, East Mindanao. May 15, 1908. Length, 73 mm.

1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 70 mm.

1 example, Simaluc Island. September 22, 1909. Length, 78 mm.

6 examples, Sitanki Reef. September 24, 1909. Length, 70 to 89 mm.

20709. Tambul Sigumbul, Tonquil Island. September 14, 1909. Length, 74 mm.

19217. Tapiantana Island. September 13, 1909. 6 examples. Length, 75 to 90 mm. [1924, 1927.] Black centered pale rimmed ocellus near middle of soft dorsal and probably green spot at beginning of lateral line.

2 examples, Tara Island. December 15, 1909. Length, 54 to 76 mm.

1 example, Tataan Island. Tawi Tawi Islands. February 20, 1908. Length, 87 mm.

1 example, Tumindao Island, reefs south lagoon. February 26, 1908. Length, 83 mm.

3 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 62 to 70 mm.

13663 and 13664. Limbe Strait, Celebes. November 10, 1909. Length, 69 to 88 mm.

1 example, Sadaa, Celebes. November 17, 1909. Length, 79 mm.

1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 72 mm.

5 examples, Tidore Island, south of Ternate. November 5, 1909. Length, 62 to 80 mm.

4 examples, Tidore Island. November 25, 1909. Length, 65 to 78 mm.

POMACENTRUS TRIPUNCTATUS Cuvier

Pomacentrus tripunctatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 421. Vanicolo.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 33 (copied).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 27 (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 89 (Bacon).—Bamber, Journ. Linn. Soc. London, Zool., vol. 31, 1915, p. 481 (between Suez and Suakim).

Pomacentrus vanicolensis Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 421. Vanicolo.—Günther, Cat. Fish. Brit. Mus., 1862, p. 33 (copied).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang).

Pomacentrus emarginatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 422. Waigiu.—Lesson, Voy. Coquille, Poiss., pt. 2, vol. 1, 1830, p. 189, pl. 28, fig. 1 (Waigiu).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Ticao).

Pomacentrus chrysurus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 423. South Sea.—Günther, Cat. Fish. Brit. Mus., 1862, p. 29 (Amboina).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 342 (Darnley Island).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Cebu).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 545 (C. de Cebu).

Chaetodon chrysurus (Broussonet) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 423 (name in synonymy).

Pomacentrus trilineatus (Ehrenberg) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 428. Red Sea and Moluccas.—Günther, Cat. Fish. Brit. Mus., 1862, p. 25 (Red Sea, Massaua, Moluccas).—Günther, Fishes of Zanzibar, 1864, p. 82 (Aden).—Peters, Monatsb. Akad. Wiss., Berlin, 1868, p. 271 (Pulobraina, Singapore).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 522 (Kosier, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 382.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 406 (7), figs. 1–6.—Kossman and Räuber, Zool. Ergebn. K. Acad. Wiss., Berlin, vol. 1, 1877, p. 23 (Red Sea).—Günther, Philos. Trans. Roy. Soc., vol. 188, 1879, p. 470 (Rodriguez).—Klunzinger, Sitzs. Ber. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 396 (Port Darwin and Port Denison).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (North Celebes and Mysore).—Day, Faun. British India, vol. 2, 1889, p. 381.—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 15, 1895, p. 271 (Ambon).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 139 (Ternate).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 753 (type of *Pomacentrus dorsalis* Gill).—Borsieri, Ann. Mus. Civ. Genova, vol. 41, 1904, p. 213 (Massaua and Nocra, Red Sea).—Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 127 (Ambon, Waigiu, Halmaheira).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 337 (Savu, Borneo Bank, Muaras Reef, Sanguislapo, Siau Island, Karakelang Island, Beo, Lirung, Damar, Ceram, Saleyer, Ambon, Nasa Laut, Tiur Island, Timor, Rotti, Samau).

Pomacentrus (*Pseudopomacentrus*) *trilineatus* Bleeker, Naturk. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 60 (Sumatra, Batu, Nias, Singapura, Banka, Biliton, Java, Bawean, Bali, Celebes, Flores, Solor, Timor, Ternate, Halmaheira, Buru, Ceram, Amboina, Haruko, Goram, Guebe, Aru, Waigiu, New Guinea, Philippines).

Pomacentrus taeniops (not Cuvier) Lesson, Voy. Coquille, Poiss., vol. 2, 1830 (not p. 190), pl. 28, fig. 2 (Mauritius).—Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 729 (Banka).

Pomacentrus biocellatus RÜPPELL, Neue Wirbelth., Fisch., 1835, p. 127, pl. 31, fig. 3. Massaua.—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 396 (Kupang, Timor).

Pomacentrus marginatus SCHLEGEL and MÜLLER, Nat. Ges. Nederl. Zool., vol. 2, 1839–1844, p. 20. Waigiu.

Pristotis fuscus BLEEKER, Verh. Bat. Genoot. (Bali), vol. 22, 1849, p. 9. Boleling, Bali.

Pomacentrus katunko BLEEKER, Nat. Tijd. Ned. Indie, vol. 3, 1852, p. 169. Timor, Kupang.

Pomacentrus catunco PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Luang, Samar).

Pomacentrus taeniometopon BLEEKER, Nat. Tijd. Ned. Indie, vol. 3, 1852, p. 283. Wahai, Ceram.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 25 (East Indies).—KNER, Sitz. Ber. Akad. Wiss. Wien, vol. 58, 1868, p. 348 (Kandavu).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Sangi and Mysore).

Pomacentrus bankanensis BLEEKER, Nat. Tijd. Ned. Indie, vol. 5, 1853, p. 513. Banka.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 26 (China Sea).—DAY, Fishes of India, pt. 3, 1877, p. 383.

Pomacentrus simsiang BLEEKER, Nat. Tijd. Ned. Indie, vol. 11, 1856, p. 90. Batavia.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, p. 22 (copied).

Pomacentrus sinsiang ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 544 (Samar and Borongan).

Pomacentrus montrouzieri THIOLLIÈRE, Faun. Woodlark, 1857, p. 200. Woodlark Island.

Pomacentrus dorsalis GILL, Proc. Acad. Nat. Sci. Phila., 1859, p. 147. Shimoda, Japan.—JORDAN and SNYDER, Annot. Zool. Jap., vol. 3, 1901, p. 86 (Japan and Riu Kiu?).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 504 (Okinawa).

Pomacentrus bilineatus CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, 1873, p. 89. Port Darwin.

Pomacentrus punctolineatus CARTIER, Verh. Ges. Würzburg, vol. 5, 1874, p. 98. Bohol.—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 544 (Bohol).

Pomacentrus littoralis (not CUVIER) DAY, Fishes of India, pt. 3, 1877, p. 383 (part).

Pomacentrus delurus JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 783, fig. 6. Negros, Philippines.

Pomacentrus tropicus SEALE, Philippine Journ. Sci., vol. 4 (6), 1909, p. 517, pl. 12, fig. 1. Sitanki Island, Jolo Archipelago.

Pomacentrus elongatus SEALE, Philippine Journ. Sci., vol. 4, 1909, p. 518, pl. 12, fig. 2. Limbones Cove at entrance to Manila Bay.

Pomacentrus opisthostigma FOWLER, Proc. Acad. Nat. Sci. Phila., 1918, p. 51, fig. 20. Philippines.

Depth 1⅞ to 2⅕; head 3⅕ to 3⅖, width 1⅗ to 1⅘. Snout 2⅔ to 4; eye 2⅔ to 3⅘, 1¼ in snout or greater than snout in young, 1 to 1⅛ in interorbital; maxillary nearly or quite to eye, little beyond eye front in young, 3¼ to 3⅘ in head; teeth compressed, uniserial, ends slightly rounded to truncate, entire, form continuous cutting edge; interorbital 2⅘ to 3⅙ in head, convex; infraorbital and hind preopercle edge usually strongly and roughly

denticulate, and invariably large spine, sometimes bifid, from lower preorbital edge, hooked back. Gill rakers 7 to 8+15, lanceolate, slender, moderate.

Tubes in lateral line 15 to 17, pores in straight section 7 to 9+1 to 3, sometimes 4 or 5 pores may follow down behind tubes variously irregular; 3 scales above lateral line, 6 to 9 below, 18 to 22 predorsal variously forward to nostril or end of snout; cheek with 2 or 3 rows of scales, usually lowest row very small and inconspicuous and infraorbital naked; soft vertical fins densely scaly basally. Scales with 7 to 9 basal radiating striae; apical denticles 101 to 135, with 1 to 3 transverse series of basal elements; circuli very fine.

D. XIII or XIV, 14, 1 or 15, 1, last spine 1½ to 1⅞ in head, seventh ray 1⅛ to 1⅓, sometimes first ray simple; A. II, 13, 1 or 14, 1, second spine 1⅗ to 1⅘, seventh ray 1¼ to 1⅓; least depth of caudal peduncle 1⅞ to 2$\frac{1}{10}$; pectoral 1 to 1⅛; caudal usually deeply emarginate, at least in large examples, 3⅛ to 3¼ in combined head and body; ventral 3 to 3⅗.

General color variously pale yellowish to dusky or deep umber brown, greatly extreme. Sometimes with small blue-gray dots or spots, 1 on each body scale, or on head large, then usually blue-gray line from side of snout to eye and row of large spots on upper row of cheek scales producing another streak. Still other examples may have a short blue line on the preorbital below or another elongated, from tip of snout up to interorbital or beyond. Also top of head sometimes finely speckled with minute blue dots. Opercular scales at beginning of lateral line variously gray, blue to black and conspicuous, often absent or obscure. Iris brown or yellow, sometimes crossed obliquely with blue line above and another below, as if in continuation of blue lines on snout or muzzle. Fins range from bright yellow to uniform dusky or even blackish, sometimes only caudal yellow and in strong contrast. Yellow examples may have upper edges of both dorsals and lower edges of both anals dusky, appearing as dark line when fin folds. Quite distinctive are very many examples with 2 white or gray longitudinal lines on anal, often only the lower present. These more noticeable in yellow examples, less conspicuous or frequently absent in dark ones. Paired fins yellow to blackish. Most examples show at least traces of a small, dark brown to dusky spot at pectoral origin, axil of fin not darker than rest. Frequently examples have a variably large or small black ocellus on the last dorsal rays, usually basal or subbasal, or even may be present as a saddle on the upper caudal peduncle surface.

Widely distributed through the Indo-Pacific, from the Red Sea, East Africa, and Mauritius to India, the East Indies, Riu Kiu, Australia, and Polynesia. The very great variation of color is fairly

well illustrated by Bleeker's figures. We have several specimens which form a distinct variation in color, apparently not noticed before. It has usually 2 round pale blotches on the back, first below middle of spinous dorsal and second at front of soft dorsal, extending on the fin base. The body is generally chocolate and the caudal yellow, also small dark spot at beginning of lateral line and pectoral with a dusky blotch.

2 examples, Albijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 45 to 63 mm.

13720. Alimango Bay, Burias Island. March 5, 1909. Length, 65 mm.

1 example, Atulayan Bay, Luzon. June 17, 1909. Length, 37 mm.

8 examples, Bolalo Bay, Palawan Island. December 21, 1908. Length, 50 to 78 mm.

1 example, Balikias Bay, Lubang Island. July 17, 1908. Length, 42 mm.

1 example, Batan Island, Rapurapu Straits. June 5, 1909. Length, 38 mm. [1607.] Slaty; caudal whitish, becoming yellow distally; dorsal and anal similar to body, former with black spot on upper posterior rays; ventrals black, with bluish front; pectorals pale yellow; small black spot at upper angle of gill opening; narrow bluish dashes on preorbital; row of dots along hinder preopercular limb.

15 examples, Batan. June 5, 1909. Length, 23 to 41 mm.

2 examples, Batan Island. July 22, 1909. Length, 41 to 55 mm.

5 examples, Butauanan Island, June 13, 1909. Length, 54 to 78 mm.

46 examples, Biri Channel. June 1, 1909. Length, 50 to 83 mm.

15 examples, Biri Channel. June 2, 1909. Length, 58 to 82 mm.

3 examples, Bubuan Island, Jolo. February 14, 1908. Length, 45 to 65 mm.

1 example, Busin Harbor, Burias Island. Length, 72 mm.

309 and 310. Busin Harbor. March 8, 1909. 6 examples. Length, 40 to 70 mm.

1 example, Busin Harbor. April 22, 1908. Length, 68 mm.

2 examples, Busin Harbor. April 23, 1908. Length, 73 to 78 mm.

9 examples, Busin Harbor. June 2, 1908. Length, 40 to 70 mm.

203 and 21699. Cabugao Bay, Catanduanes Island. June 9, 1909. Length, 58 mm.

20103. Cagayan, Sulu. January 8, 1909. Length, 48 mm. [1071.] Olive-green, shaded with smoky above; on side of head many small spots of pale; a speck of purple on upper angle of opercle; two narrow blue stripes from eye to front or dorsal and median stripe of same color; dorsal body-color, black centered ocellus, with blue to white border, on posterior portion about twice diameter of eye; caudal dusky, base whitish; anal olive, crossed obliquely by obscure purplish bars; ventrals dusky; pectorals very pale olive, with black spot at base of first ray.

22588. Caiholo River, Ulugan Bay, Palawan. December 29, 1908. 11 examples. Length, 51 mm.

5 examples, Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 53 to 63 mm.

1 example, Candaraman Island, Balabac. January 4, 1909. Length, 67 mm.

29 examples, Canimo Island near Daet. June 15, 1909. Length, 36 to 70 mm.

12 examples, Caracaran, Batan Island. June 8, 1909. Length, 42 to 70 mm.

4 examples, Casogoran, Malhon Island. July 27, 1909. Length, 63 to 78 mm. [1707.] Upper portion of head blackish-olive from corner of mouth through lower edge of eye to opercle angle; area above pectoral covering anterior upper portion of body, greenish below, becoming rather washed with pink

above, extending into dorsal to tenth spine; similar area under posterior part of soft dorsal from fourth ray to end of fin; between these blotches and lower part of body, including caudal peduncle, gray with slight drab shade above; breast and throat dusky; dorsal with narrow blue margin on black line, fading out on soft part; caudal dusky, somewhat blackish at tip; anal rather drab with purplish line from base of second spine following parallel to margin to near tip of about ninth ray; outward from this greenish; anus blue and black; ventrals pale, with somewhat greenish front; pectorals dusky, axil violet-black; few blue spots on chin and interopercle.

4 examples, Casogoran, Malhon Island. July 27, 1909. Length, 72 to 76 mm. [1724.] Brown, with yellowish shades. Black spot at suprascapula and one at base of dorsal posteriorly, margined narrowly blue in front and below, as half ocellus. Fins like body, become darker terminally. Small black speck at pectoral origin.

1 example, Cataingan Bay, Masbate. April 17, 1908. Length, 58 mm.

10612. Cataingan Bay. April 18, 1908. Length, 53 to 69 mm. 13 examples. [554.] Bright yellow, olivaceous above, with dark punctulations on lower head and breast; blue blotch at upper angle of opercle; vertical fins body color, becoming more distinctly orange posteriorly; paired fins same but paler; anal olivaceous anteriorly, with oblique heliotrope bar from base of spines to tip of fin; some scales on sides show purplish shades at bases.

3 examples, Cataingan Bay. April 19, 1908. Length, 44 to 62 mm.

2 examples, Cataingan Bay. November 14, 1909. Length, 36 to 52 mm.

26 examples, Catbalogan, Samar. April 14, 1908. Length, 88 to 102 mm.

10 examples, Catbalogan. April 15, 1908. Length, 75 to 93 mm. [5915 to 5916, 5918, 5921, 5927.]

9 examples, Cebu, reef opposite. April 7, 1908. Length, 13 to 25 mm.

3 examples, Cuyo, Cuyo Island. April 9, 1909. Length, 59 to 70 mm.

10840. 6 examples, Dalaganem Island. April 8, 1909. Length, 55 to 90 mm. [7421 and 7422.]

20 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 50 to 72 mm.

13227. 3 examples, Doworra Island. December 2, 1909. Length, 32 to 58 mm.

8 examples, Endeavor Strait, beach at village near Chase Head, Palawan. December 22, 1908. Length, 48 to 80 mm.

1 example, Endeavor Strait. December 23, 1908. Length, 62 mm.

2 examples, Endeavor Strait. December 28, 1908. Length, 64 to 68 mm.

1 example, Galera Bay, Mindoro. June 8, 1909. Length, 59 mm.

13296. Gomomo Island. December 3, 1909. 6 examples. Length, 50 to 77 mm.

6 examples, Great Tobea Island. December 15, 1909. Length, 47 to 85 mm.

14438. Gubat Bay, Luzon. June 23, 1909. 2 examples. Length, 28 to 64 mm.

3 examples, Guiniyan Island. June 4, 1909.

2 examples, Guntao Island. December 20, 1908. Length, 44 to 54 mm.

1 example, Inamucan Bay, Mindanao. August 8, 1909. Length, 66 mm.

1 example, Isabel, Basilian. September 11, 1909. Length, 68 mm.

4 examples, Jolo. March 6–7, 1908. Length, 62 to 68 mm. [407.] Yellowish, becomes olive-green in formaline. Caudal cadmium. Hind tips of anal and dorsal alike, shade into body-colors. Black line at tips of ventral rays, olive-green and lavender-pink bar below. Pectoral yellowish, black spot in upper axil.

1 example, Labuan Blanda Island. December 14, 1909. Length, 68 mm.

14688. Langao Point, Luzon. June 24, 1909. Length, 59 mm.

16551. Langao Point, Luzon. June 24, 1909. 4 examples. Length, 38 to 62 mm.
2 examples, Libig, Lubang Island. July 14, 1908. Length, 50 to 63 mm.
4 examples, Ligpo Point, Balayan Bay. Length, 52 to 65 mm.
1 example Ligpo Point. January 18, 1908. Length, 63 mm.
14834. Little Santa Cruz, Zamboanga. March 26, 1908. Length, 43 to 73 mm.
1 example, Little Santa Cruz Bay. May 28, 1908. Length 78 mm.
7 examples, Mactan Island, Cebu. March 25, 1909. Length, 53 to 75 mm.
6 examples, Mactan Island. August 31, 1909. Length, 15 to 90 mm.
3 examples, Maculabo Island. June 14, 1909. Length, 66 to 73 mm.
1 example, Maitara Island. March 26, 1909. Length, 44 mm.
2 examples, Maitara Island. November 26, 1909. Length, 57 to 69 mm.
15021, 19964, 19965. 1 example, Makesi Island, Palawan. April 5, 1909. Length, 66 to 81 mm.
5 examples, Makyan Island. November 29, 1909. Length, 53 to 68 mm.
7 examples, Mansalay, Mindoro. June 4, 1908. Length, 50 to 53 mm.
2 examples, Mantacao Island, west coast Bohol. April 8, 1908. Length, 52 to 67 mm.
1 example, Maribojoc Bay. March 26, 1909. Length, 85 mm.
4 examples, Marongas Island. February 10, 1908. Length, 30 to 54 mm.
1 example, Murcielagos Bay. August 9, 1909. Length, 57 mm.
1 example, Murcielagos Bay, Mindanao. August 21, 1909. Length, 80 mm.
1 example, Nabatas Point, Samar. July 24, 1909. Length, 70 mm.
4 examples, Nasapit, Mindanao. August 1, 1909. Length, 54 to 81 mm.
21713. Nato River tidewater. June 18, 1909. Length, 70 mm.
1 example, North End Endeavor Strait, northwest coast of Palawan. December 22, 1908. Length, 50 mm.
2 examples, Opol, Mindanao. August 4, 1909. Length, 45 to 60 mm.
3 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 66 to 85 mm.
281. Paluan Bay, Mindoro. December 11, 1908. 3 examples. Length, 62 to 75 mm.
9 examples, Pandanon Island. March 23, 1909. Length, 40 to 67 mm.
14365. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 60 mm.
1 example, Panpan, Tara Island. September 20, 1909. Length, 60 mm.
15 examples, Philippines. Length, 39 to 86 mm.
6866. Philippines. Length, 36 mm.
3 examples, Porongpong Island, Palumbanes Group. June 11, 1909. Length, 55 to 67 mm.
2 examples, Port Banalacan, Marinduque. February 23, 1908. Length, 31 to 58 mm.
14961. Port Ciego, Balabac. January 3, 1909. Length, 67 mm.
1 example, Port Galera. October 27, 1909. Length, 60 mm.
2 examples, Port Jamelo, Luzon. July 13, 1908. Length, 66 to 86 mm.
19143. Port Langcan, Dumaran Island. April 7, 1909. Length, 63 mm.
3 examples, Port Maricaban. July 21, 1908. Length, 50 to 64 mm.
2 examples, Port Matalvi, Luzon. November 22, 1908. Length, 44 to 54 mm.
9 examples, Port Matalvi, Luzon. November 23, 1908. Length, 82 to 100 mm. [712.] Head and back smoky-brown, darker anteriorly, chin same. Under surfaces yellow. Caudal peduncle, except above, lavender. Vent margined with black. Triangle on outer edge of interspinous membranes of dorsal deep smoky-brown, lighter band below; basal half of spinous dorsal darker; dorsal rays yellowish-orange for terminal half, smoky terminally; axis of

dorsal smoky-lavender. Anal with narrow smoky margin, body of fin smoky-yellow and axil smoky-lavender. Outer caudal rays dusky-orange, rest of fin dusky. Paired fins yellow.

10 examples, Port Palapag. June 3, 1909. Length 30 to 60 mm.

20784. Powati Harbor, Makyan Island. November 28, 1909. Length, 55 mm.

1 example, Puerta Princesa. April 5, 1909. Length, 51 mm.

4 examples, Pujada Bay. May 15, 1908. Length, 60 to 70 mm.

1 example, Quinalasag Island, Masamat Bay. June 12, 1909. Length, 60 mm.

5 examples, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 51 to 68 mm.

1 example, Rapu Rapu. June 22, 1909. Length, 40 mm.

17499. Refugio, Pasacao, Luzon. March 9, 1909.

14763. Romblon. March 26, 1908. 2 examples. Length, 46 to 58 mm.

1 example, Sablayan, Mindoro. December 12, 1908. Length, 64 mm.

2 examples, Sacol Island. September 9, 1909. Length, 70 to 75 mm.

4 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 42 to 62 mm.

1 example, Santa Cruz, Marinduque. April 24, 1908. Length, 50 mm.

1 example, Santa Cruz Island. April 24, 1908. Length, 74 mm.

20500. Santa Maria, Siquijor Island. August 11, 1909. Length, 58 mm.

4 examples, Sitanki Reef. September 24, 1909. Length 68 to 70 mm.

1 example, Subig Bay. January 7, 1908. Length, 31 mm.

1 example, Sulade Island. September 17, 1909. Length, 67 mm.

2 examples, Talisse Island. November 9, 1908. Length, 51 to 54 mm.

21911. Tapiantana Island. September 13, 1909. Length, 70 mm. [1925.] Cadmium-yellow, with somewhat olive wash on top of head and anterior back; flaps dusky above; anal with dusky olive front and margin; small black speck at upper base of pectoral.

1 example, Tapiantana Island. September, 13, 1909. Length, 70 mm. [1927.] Lavender drab above, becoming pearl-gray below, with yellow wash on lower head, breast and belly; dorsal similar to back, incised spinous membranes and flaps olive, soft portion of fin pale yellow; caudal yellow with dusky tip; anal yellow, crossed by about three more or less oblique pale lavender bars; paired fins yellow, black blotch on upper base of pectoral.

3 examples, Tara Island. December 14, 1908. Length, 58 to 74 mm.

3 examples, Tara Island. December 15, 1908. Length, 62 to 77 mm. [804, 787.] Sooty caudal peduncle and fin, with pink shade; black blotch, with white half ring, anteriorly, near tip of soft dorsal; base of pectoral yellowish; black bar across front.

1 example, Tataan Island, Tawi Tawi Group. February 2, 1908. Length, 77 mm.

2 examples, Tataan Island. February 18, 1908. Length, 40 to 45 mm.

5 examples, Tataan Island. February 20, 1908. Length, 47 to 75 mm. [169.]

2 examples, Tataan Islands. February 21, 1908. Length, 62 to 70 mm.

Tinakta Island. February 21, 1908. Length, 30 to 62 mm. (D. 5159.)

2 examples, Tobea Island. December 15, 1909. Length, 46 to 55 mm.

6151 and 20744. Tonquil Island, east of Gumila Reef. September 14, 1909. 8 examples. Length, 55 to 68 mm. [1936.] Olive yellow above, becoming more grayish but with yellow wash below; median blue stripe on forehead from snout to front of dorsal; similar stripe on either side running along front of dorsal to third spine; few obscure dusky-blue stripes behind eye; blue spot at beginning of lateral line; dorsal similar to body, crossed by two yellow bars, one immediately under incised portion of dorsal membranes,

other slight distance below latter ending with second ray; pale (or blue) rimmed black centered ocellus on last dorsal rays; caudal whitish, tips with some rays yellow; anal olive yellow crossed by one or two lavender oblique bars; ventrals dusky-yellow; pectorals hyaline yellow, small black blotch at upper base.

5 examples, Tulayan Island. September 15, 1909. Length, 45 to 68 mm.

12 examples, Tumindao Island, reefs of south lagoon. Length, 43 to 87 mm. [347 to 351.] February 26, 1908. Yellowish-olive above, becoming cadmium orange on hinder part of verticals and all of caudal. Anal edged with blackish-green, with indistinct pale stripe from base of spines to tip of longest rays. Minute blackish blotch on upper base of pectoral and upper angle of opercle. 350 and 351 do not show opercular spot in formalin.

20125. Ulugan Bay. December 28, 1908. Length, 58 mm.

7 examples, Usada Island near Jolo. March 3, 1908. Length, 73 to 82 mm. [371 to 376.] Dark olive-green, with yellowish shades below; small black blotch at base of pectoral above; blue-black blotch nearly as large as pupil on upper edge of opercle; black ocellus, with bluish-white rim on posterior margin of dorsal. Incised tips of spinous dorsal dusky, paler bar beneath them. Caudal dusky, peduncle whitish. Anal very similar to dorsal. Ventral dusky. Pectoral dusky lemon-yellow. Larger specimen with irregular rows of dusky-purple specks on middle of side.

1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 52 mm.

2 examples, Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 56 to 70 mm.

1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 84 mm.

2 examples, Sadaa, Celebes. November 17, 1909. Length, 49 to 62 mm.

3 examples, Togian Bay, Togian Island, Celebes. November 19, 1909. Length, 52 to 78 mm.

2 examples, Tidore Island, south of Ternate. November 24, 1909. Length, 57 to 65 mm.

10 examples, Tidore Island. November 25, 1909. Length, 54 to 68 mm.

4 examples, Apra Bay, Guam. November 19–21, 1907. Length, 73 to 103 mm.

33298 U.S.N.M. Bacon. Bureau of Fisheries. 1 example. Length, 83 mm.

51968 U.S.N.M. Negros Island. Dr. B. Dean. 1 example. Length, 60 mm.

52052 U.S.N.M. Negros Island. Dr. B. Dean. 1 example. Length, 38 mm. Type of *Pomacentrus delurus*.

56187 U.S.N.M. Luzon. Phillippine Commission. Length, 65 mm.

56189 U.S.N.M. Luzon. Philippine Commission. Length, 68 mm.

64123 U.S.N.M. Shimoda. Length, 83 mm. Type of *Pomacentrus dorsalis*.

71663 U.S.N.M. Nafa, Riu Kiu. *Albatross* collection. 4 examples. Length, 37 to 48 mm.

72210 U.S.N.M. Ticao Island. R. C. McGreggor. 1 example. Length, 43 mm.

27674 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 47 mm.

27675 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 85 mm. As *Pomacentrus vanicolensis*.

33298 A.N.S.P. Bacon, Philippines. Bureau of Fisheries. Length, 83 mm.

47528 to 47530 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length 41 to 65 mm. Types of *Pomacentrus opisthostigma*.

POMACENTRUS GRAMMORHYNCHUS Fowler

Pomacentrus grammorhynchus Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 44, fig. 17. Philippines.

Depth 1⅝ to 2; head 3 to 3⅔, width 1⅖ to 1¾. Snout 2⅘ to 3; eye 3⅕ to 3¼, 1⅕ to 1⅓ in snout, 1⅕ to 1⅓ in interorbital; maxillary ¾ to ⅘ to eye, 3⅛ to 3⅔ in head; teeth compressed, uniserial, ends rounded, uniform; interorbital 2½ to 3, broadly convex; preorbital with broad flat recurved spine below and rest of infraorbital edge well denticulate; hind preopercle edge strongly denticulate. Gill rakers 6 + 13, lanceolate, slender, moderately long.

Tubes in upper section of lateral line 17 or 18, followed by 3 to 5 pores; pores in straight section 8 or 9 to caudal base and 0 to 2 on latter; 3 scales above lateral line, 10 or 11 below, 18 to 23 predorsal which extend forward nearly to snout tip. Scales with 7 to 11 basal radiating striae, edge scalloped; apical denticles 118 to 180, with 1 to 2 transverse series of basal elements; circuli very fine.

D. XIII, 14, 1 or 15, 1, thirteenth spine 1⅕ to 1¾ in head, eighth ray 1⅖ to 1½; A. II, 14, 1 or 15, 1, second spine 1⅞ to 2, sixth ray 1⅗ to 1⅘; least depth of caudal peduncle 1⅞ to 2⅛; caudal emarginate, lobes rather rounded, 3 to 3⅛ in combined head and body; pectoral 3 to 3⅕; ventral 3 to 3¼.

Brown, sometimes variably darker or dusky-brown above, and on dorsals, anals, and pectorals. Iris brownish. Preorbital and infraorbitals grayish medianly. Uppermost row of cheek scales each with large gray blotch, also few scattered gray spots on other cheek scales. Opercular scales with large grayish blotches. On opercle above, just below origin of lateral line, a neutral dusky spot about half or less size of pupil. Caudal peduncle and caudal often lighter brown than body color, sometimes light buff or yellowish buff. Paired fins dusky and pectoral base dusky brown with blackish spot at origin, behind which a small distinct whitish spot, pectoral axil entirely white.

Philippines. The dark line on the side of the snout, from the snout end to the eye, though still visible, appears to be the result of preservation in formaline. Likewise the pectoral axil has turned dark and the gray spots on the side of the head faded. The white spot at the origin of the pectoral, within a dark area, is noteworthy.

47 examples, Biri Channel. June 1, 1909. Length, 56 to 83 mm.

14509. Biri Channel. June 2, 1909. 7 examples. Length, 48 to 78 mm. [1556.]

33 examples, Candaraman Island, Balabac. January 4, 1909. Length, 64 to 97 mm.

5 examples, Casogoran, Malhon Island. July 27, 1909. Length, 83 to 96 mm. [1710.] Top of head and back blackish olive; lower parts dusky, but paler; obscure lines on region behind pectoral sometimes extended; side of head

with broad purplish or brownish blotches, fusing into general color; caudal peduncle becoming orange at base of fin, caudal fin bright cadmium; dusky blue blotch behind dorsal axil; dorsal color of adjacent back, slightly washed with orange on last four or five rays; anal similar to dorsal; paired fins blackish; pectoral axil orange, showing slightly above base; no lines or blotches on any of fins.

1 example, Little Santa Cruz Island. May 28, 1908. Length, 90 mm.

1 example, Pangasinan Island. February 13, 1908. Length, 52 mm.

9 examples, Sacol Island. September 9, 1909. Length, 75 to 88 mm.

14383, 14386, 14412. Talisse Island. November 9, 1909. 4 examples. Length 76 to 90 mm.

1 example, Tataan Bay, Tataan Island, Tawi Tawi Group. February 20, 1908. [156.] Smoky-black on back, becoming gray below, scales with purplish reflections posteriorly; opercle with reddish shades; caudal peduncle and caudal cadmium-orange; anal smoky-slate, with greenish shades; ventral and pectoral slaty; orange spot at edge of base and in axil of pectoral; iris with golden and pink shades.

1 example, Tataan, Simaluc Island. February 20, 1908. Length, 78 mm. [171.] Olive to bister on top of head and back, becoming greenish-drab below; dorsal clove-brown; caudal cadmium-orange; anal like dorsal; orange spot in pectoral axil; pectoral and ventral paler than vertical fins; lower iris and opercle with magenta-purple reflections.

7 examples, Tumindao Island, southern lagoon. February 26, 1908. Length, 73 to 90 mm.

1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 75 mm.

14339. Tobea Island. December 14, 1909. Length, 94 mm. [2147.]

47518 A.N.S.P. Philippines. From Philadelphia Commercial Museum. Type.

POMACENTRUS LEPIDOGENYS, new species

Depth 2; head 3¼, width, 1¾. Snout 4; eye 2¾, greater than snout or interorbital; maxillary reaches opposite front of eye, 3⅕ in head; teeth uniserial, compressed, ends subtruncate and form rather even cutting edge; interorbital 3⅕, broadly convex; preorbital and infraorbital edge not free; hind preopercle edge with few denticles. Gill rakers 6+14, slender, lanceolate, moderate.

Tubes in lateral line 17, followed by 3 irregular pores; pores in straight section 9 to caudal base and 2 more in latter; 3 scales above lateral line, 9 below, 20 predorsal forward opposite nostrils; cheek with 5 rows of scales, of which uppermost on infraorbitals as single row to preorbital. Scales with 10 basal radiating striae; apical denticles 110, with 2 or 3 transverse rows of basal elements.

D. XIII, 13, 1, fourth spine 3 in head, fifth ray 1⅓; A. II, 13 1, second spine 2⅛; fifth ray 1⅗; caudal emarginate, 1; least depth of caudal peduncle 2⅛; pectoral 1; ventral 3⅛ in combined head and body.

Dull brown generally, with slight olivaceous tinge, back and upper surface of head darker. Grayish streak from preorbital below following infraorbitals along lower and hind eye edge. Iris deep neu-

tral, with greenish gray ring around pupil. Spinous dorsal deep dusky or blackish-brown, other vertical fins deep brown, pale brown at bases of soft dorsal, anal and caudal. Pectoral dull brown, with small dusky spot at origin, axil of fin pale. Ventral dusky brown anteriorly to ends of first rays, posterior rays pale or whitish. No dark scale at suprascapular region. Vent pale.

Known only from the examples listed below. They somewhat resemble *Abudefduf bankieri*, but are without a dark suprascapular scale or blotch and the soft vertical fins are brown like the body.

Type.—Cat. No. 89959, U.S.N.M.

2 examples, Batan Island. June 5, 1909. Length, 59 to 61 mm.
1 example, Ligpo Point, Balayan Bay. January 18, 1908. Length, 68 mm. Type.

(Λεπὶς scale; γένῦς, cheek; with reference to the scaled suborbitals.)

POMACENTRUS REIDI, new species

Depth 1⅝ to 2; head 3⅓ to 3½, width 1½ to 1⅗. Snout 3⅞ to 4; eye 2⅞ to 3⅔, 1 to 1⅛ in interorbital; maxillary reaches eye, 3⅛ to 3⅕ in head; teeth uniserial, compressed moderately, and tips rounded; interorbital 2⅗ to 2¾, convex; suborbital edge entire, with small spine on lower preorbital edge; hind preopercle edge denticulate. Gill rakers 5+14, lanceolate.

Tubes in lateral line 16 or 17, followed by 4 or 5 irregular pores, pores in straight section 8 to caudal base+2 or 3 more; 4 scales above lateral line, 6 below, 24 or 25 predorsal which extend to nostril or slightly forward, though not to upper lip; soft vertical fins scaled over greater portion vertically. Scales with 7 to 9 basal, short, marginal and nearly parallel striae, edge scalloped; apical denticles 121 to 170, basal elements in 2 series; circuli very fine.

D. XIII or XIV, 13 to 15, fourth spine 2⅛ to 2⅕ in head, sixth ray 1⅓ to 1½; A. II, 13 or 14, second spine 1⅘ to 2⅕, fourth ray 1⅖ to 1⅗; least depth of caudal peduncle 1⅞ to 2; caudal emarginate, 3¼ to 3⅖ in combined head and body; pectoral 3⅛ to 3⅖; ventral 3 to 3¼.

Brown, nearly uniform or but little paler below. Iris golden brown. Young with gray line along suborbital. Dorsals and anals deep brown. Caudal usually pale, sometimes light gray or sometimes all rayed vertical fins pale brown. Dark to dusky brown small spot, much less than pupil, at pectoral origin, little invading axil of fin. Paired fins pale brown.

Type.—Cat. No. 89960, U.S.N.M.

A dull-colored species, known by the small dark spot at the pectoral origin.

13719. Alimango Bay, Burias Island. March 5, 1919.

13 examples, Biri Channel, Balicuatro Islands. June 1, 1909. Length, 58 to 75 mm. [1552.] Dull greenish with dusky and purplish shades above, paling to almost white below; distal end of caudal peduncle, base of fin and most of base of soft dorsal yellowish, latter brightest, rather chrome shade; tip of soft dorsal and flaps of all spines dusky; spinous membranes become yellowish posteriorly, brown anteriorly; distal portion of caudal somewhat dusky; anal dusky, with slightly yellowish shades basally; paired fins dusky; ventrals showing a trace of straw yellow; pectorals with small dusky spot on upper base.

1 example, Bugsuk, Balabac. January 5, 1909. Length, 61 mm.

3 examples, Caracaran, Batan Island. June 8, 1909. Length, 54 to 65 mm.

1 example, Casogoran, Malhon Island. July 27, 1909. Length, 67 mm.

2 examples, Dalaganem Island. April 8, 1909. Length, 73 to 80 mm.

2 examples, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 55 to 64 mm.

14705. Maculabo Island. June 13, 1909. Length, 70 mm.

14707. Matnog Bay. May 31, 1909. Length, 68 mm.

13995. Nasugbu, Luzon. January 16, 1908. Length, 70 mm.

6 examples, Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 60 to 75 mm.

1 example. Philippines. Length, 73 mm.

3 examples, Porongpong Island, Palumbanes Group. June 11, 1909. Length, 65 to 70 mm.

14590 and 14592. Port Palapag. June 3, 1909. Length, 47 to 68 mm.

12188. Powati Harbor, Makyan Island. November 28, 1909. Length, 110 mm.

4 examples, Pujada Bay, East Mindanao. May 15, 1908. Length, 65 to 75 mm.

1 example, Tara Island. December 15, 1909. Length, 70 mm.

1 example, Tataan Island, Tawi Tawi Group. February 2, 1908. Length, 115 mm. Type.

14124 and 14126. Tifu Bay, Bouro Island. December 10, 1909. Length, 118 and 119 mm.

1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 66 mm.

1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 121 mm.

(We take pleasure in dedicating this species to Mr. Earl D. Reid, aid in the Division of Fishes, United States National Museum.)

POMACENTRUS STIGMA, new species

Depth 1⅘ to 1⅞; head 3¼ to 3⅔, width 1½ to 1⅘. Snout 3½ to 4⅛; eye 3 to 3¼; maxillary very oblique, extends little beyond front of eye, to pupil in young, 3 to 3½ in head; teeth uniserial, conic, ends pointed; interorbital 2⅘ to 3⅛, convex; suborbital with small denticle below, otherwise entire; hind preopercle edge denticulate. Gill rakers 9+14, lanceolate.

Tubes in lateral line 14 to 16, sometimes 3 to 5 pores following irregularly down behind; pores in straight section 8 or 9+0 to 2; 4 scales above lateral line, 6 below, 23 predorsal down on snout not quite to upper lip; rayed vertical fins scaled basally. Scales with

6 or 7 basal radiating striae, edge little scalloped; apical denticles 157 to 168, with 2 transverse series of basal elements; circuli fine.

D. XIV, 12 to 14, fourteenth spine 1¾ to 1⅔ in head, sixth ray 1⅙ to 1⅓; A. II, 14, second spine 1¾ to 2, first ray 1⅗ to 1⅔; least depth of caudal peduncle 1⅘ to 1⅞; caudal deeply emarginate, 2⅞ to 3 in combined head and body; pectoral 3 to 3⅕; ventral 2⅕, sometimes equals head.

Back and upper surface brown, sides paler and under surface whitish. Iris pale yellowish. Small dusky or blackish spot at pectoral origin, much less than pupil diameter. Dorsals with dark brown terminally, pale basally. Caudal dull or pale brown. Anal with last 5 or 6 rays included in contrasted black area, rest of fin whitish, becoming little gray terminally. Paired fins pale brown.

Known only from the Philippines. A strongly marked species, distinguished by the conspicuous black blotch on the last anal rays.

Type.—Cat. No. 89961, U.S.N.M.

2 examples, Busin Harbor, Burias Island. March 7, 1909. Length, 95 to 114 mm.

1 example, Busin Harbor. March 8, 1907. Length, 53 mm.

2 examples, Canimo Island, near Daet. June 15, 1909. Length, 98 to 110 mm.

2 examples, Danawan Island and Si Amil Island. September 27, 1909. Length 80 to 108 mm.

14275. Endeavor Strait. December 22, 1908. 4 examples. Length, 108 to 112 mm.

1 example, Inamucan Bay, Mindanao. August 8, 1909. Length, 112 mm.

2 examples, Limbones Cove, Luzon Island. February 8, 1909. Length, 74 to 84 mm. [1124.] More or less soiled on top of head and anterior back, yellowish posteriorly; fins body-color, but more dusky; posterior portion of anal black.

1 example, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 110 mm.

11408. Paluan Bay, Mindoro. December 11, 1908. Length, 105 mm.

1 example, Port Caltom. December 15, 1908. Length, 110 mm.

15119. Port Dupon, Leyte Island. March 17, 1909. Length, 108 mm.

10350. Port Jamelo, Luzon. July 13, 1908. 12 examples. Length, 54 to 114 mm.

2 examples, Port Matalvi, Luzon. November 23, 1908. Length, 85 to 93 mm.

10753, 13196. Quinalasag Island, Masamat Bay. 5 examples. June 12, 1909. Length, 90 to 98 mm.

33 examples, Romblon Harbor. March 25, 1908. Length, 75 to 110 mm. Types.

1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 102 mm.

1 example, Tutu Bay, Jolo Island, first anchorage. September 19, 1909. Length, 97 mm.

(Στιγμα, blotch, with reference to the anal fin.)

POMACENTRUS PERSPICILLATUS Cuvier

Pomacentrus perspicillatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 417. No locality.

Pomacentrus trimaculatus (not Rüppell 1828) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 427. Batavia, Java.—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 20, pl. 4, fig. 2 (Java and East Celebes).—

Günther, Cat. Fish. Brit. Mus., vol 4, 1862, p. 19 (China).—Day, Fishes of India, pt. 3, 1877, p. 382, pl. 80, fig. 10.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p 34 (North Celebes, Macassar, Mysore, New Guinea).—Day, Fauna British India, vol. 2, 1889, p. 328, fig. 128.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 544 (Luzon, Cavite, Santa Cruz).—Evermann and Seale, Bull. Bur. Fishes., vol. 26, 1906 (1907), p. 89 (not 3790, Bacon and San Fabian).

Dischistodus trimaculatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 404(5), fig. 5; Nat. Verh. Holland. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 79 (Sumatra, Batu, Nias, Singapore, Duizend Islands, Java, Celebes, Buru, Amboina, Ceram).

Pomacentrus dorsomaculatus Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 298 (on Cuvier).

Depth 2 to 2⅓; head 2¾ to 3⅓, width 1⅘ to 2. Snout 2⅗ to 4; eye 2⅖ to 3⅛, 1¼ in snout, equals interorbital, much greater than snout or interorbital in young; maxillary reaches eye in young, little short in adult, 3 to 3⅖ in head; teeth uniserial, compressed, ends rather pointed; interorbital 3⅔ to 3⅘, level; infraorbital edge and hind preopercle edge serrate. Gill-rakers 12 + 22, lanceolate, slender, long.

Tubes in lateral line 16 or 17, pores in straight section 9 to 11 + 1 or 2; 4 scales above lateral line, 8 or 9 below, 20 or 21 predorsal forward opposite nostril; 3 rows of cheek scales, none on preopercle flange or interorbital. Scales with 8 or 9 basal radiating striae; apical denticles 92 to 186, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XIII, 13, 1 or 14, 1, thirteenth spine 1¾ to 1⅞ in 1 head, eighth ray 1⅓ to 1⅖, first ray sometimes simple; A. II, 14, 1, second spine 2 to 2⅕, seventh ray 1¼ to 1⅖; least depth of caudal peduncle 1¾ to 1⅘; caudal 2⅓ to 3 in combined head and body, deeply emarginate; pectoral 3⅖ to 3⅔; ventral 3⅖ to 3½.

Light yellow. Across interorbital broad white band and another across occiput followed by pale brownish blotch at occiput, which is more extensive and very distinct in young. White line from upper end of maxillary back along infraorbital and another parallel, from lower hind end of maxillary along upper row of cheek scales. Scales on cheeks and opercles spotted with white and body scales each with white vertical line, mostly faded out in preserved examples. Just behind middle of spinous dorsal basally and at bases of last dorsal rays, 2 dusky blotches about size of eye and another at vent, former 2 both extend little on back. Fins all pale or uniform light yellow. Iris yellowish with neutral spot above.

India, East Indies, China. One of the larger, handsome species, not quite like any other. Our examples all have the tail pale, not brownish as shown in Bleeker's figure. They have the submarginal white anal band in some cases, though mostly faded out. In the

very young there is only a single black blotch, which is large and at the last dorsal spines. It appears that this is really the post dorsal blotch or the one at the last dorsal rays moved forward, as the mid-spinous dorsal dark blotch disappears in examples of 40 mm. or less. In the very young the second dark blotch trails down over the tail towards the anal fins as a dark vertical band. The vent is black at all ages.

5 examples, Batan Island. June 5, 1909. Length, 53 to 56 mm.
1 example, Bugsuk Island, Balabac. Length, 122 mm.
306. Busin Harbor, Burias Island. March 8, 1909. Length, 128 to 158 mm.
8 examples, Caiholo River, Ulugan Bay, Palawan Island. December 29, 1908. Length, 60 to 84 mm.
6 examples, Candaraman Island, Balabac. January 4, 1909. Length, 100 to 135 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 146 mm.
11690 and 11691. Capunuypugan Point. May 10, 1908. Length 151 to 155 mm.
13173. Cataingan Bay. April 17, 1908. Length, 122 mm.
1 example, Cataingan Bay, Masbate. April 18, 1908. Length, 140 mm.
10702 to 10705. Cataingan Bay. April 19, 1909. Length, 102 to 125 mm.
5420. Cebu market. April 7, 1908. Length 173 mm.
10779. Dalaganem Island. April 8, 1909. Length, 180 mm.
13063. Gomomo Island. December 3, 1909. Length, 142 mm.
12 examples, Great Tobea Island. December 15, 1909. Length, 20 to 132 mm.
12133, 12138, 12139. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 150 to 173 mm.
2 examples, Philippines. Length, 110 to 130 mm.
2 examples, Port Matalvi, Luzon. November 23, 1908. Length, 123 to 150 mm.
[711.] Snout deep smoky. Between eyes small light purple blotch. Crescent shaped bar deep smoky points backward from between eyes, blackish spot posteriorly in space to dorsal fin. Chin and breast light smoky. General body-color light, scales dusky above and anteriorly, whitish below; scales of lateral line darker. Black blotch on back below middle of spinous dorsal extends up on fin; another on back and fin at dorsal axil, latter with some small light purple spots. Yellowish wash over central part of body; each scale, except of head and anterior part of back with vertical lavender line; black blotch over vent. Dorsal with thread-like margin of bluish, below which narrow yellow line, also below latter narrow line of faint lavender; body of fin dusky-rosy, darker below; rays orange. Anal with thread-like margin of blue, below which smoky band and proximally to latter faint lavender line; body of fin dusky-lavender, rays orange. Paired fins hyaline. Caudal dusky-orange at base, smoky hyaline terminally. Scales on top of caudal peduncle with dusky margins, rest of each scale light smoky-orange.
14160. Pujada Bay. May 15, 1908. Length, 137 mm.
11890. San Miguel Harbor, Ticao Island. 2 examples. April 21, 1908. Length, 138 to 163 mm.
19241 to 19248. Tara Island. December 15, 1908. Length, 115 to 180 mm.
1 example, Tataan Island, Tawi Tawi Group. February 20, 1908. Length, 64 mm. [152.] White with washes of very pale bronzy on the upper sides and black; blackish saddle on nuchal region; snout and interorbital region dusky; black blotch at middle part of base of spinous dorsal, and larger in similar relation to soft part; dorsal itself very pale pearly-gray, edged narrowly with

pearly hyaline and yellow; terminal half of soft portion washed with dull chrome. Caudal dusky at tip. Anal pearly, with dusky olive bar across tip, narrowly tipped with darker and blue posterior portion washed with yellowish; anteriorly with pearly shades. Vent black. Ventral yellowish-gray, base dusky. Pectoral whitish, dusky at base. Iris dusky, with yellowish silver posteriorly.

11679. Tutu Bay, Jolo. September 19, 1909. Length, 170 mm.

20687. Ulugan Bay. December 28, 1908. Length, 70 mm.

3 examples, Ulugan Bay, channel north of Oyster Inlet. December 28, 1908. Length, 147 to 155 mm.

3 examples, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 135 to 160 mm.

POMACENTRUS PROSOPOTAENIA Bleeker

Pomacentrus prosopotaenia Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 67. Singapore.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 23 (Moluccas and Amboina).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Pulo Brani, Singapore).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—DeVis, Proc. Linn. Soc. New South Wales, vol. 9, 1885, p. 873 (Cardwell).—Day, Fishes of India, Suppl., 1888, p. 801; Faun. British India, vol. 2, 1889, p. 384.

Dischistodus prosopotaenia Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 8; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), sec. 3, vol. 2, 1877, p. 80 (Nias, Singapura, Pulu Brani, Java, Bawean, Celebes, Timor, Halmahera, Batjan, Buro, Amboina, Ceram, Philippines).

Pomacentrus interorbitalis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 30. East Indian Archipelago.

Pomacentrus perspicillatus (not Valenciennes) Kner, Reise Novara, Fisch., pt. 2, 1865, p. 241 (Singapore).

Pomacentrus albofasciatus (not Schlegel and Müller) Day, Fishes of India, pt. 3, 1877, p. 384, pl. 80, fig. 9 (Nicobars).

Dischistodus cartieri Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 82, Cebu (on *Pomacentrus* sp. Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1873, p. 100).

Depth 2 to 2⅕, head 3⅕ to 3½, width 1⅘ to 1⅞. Snout 2½ to 3¾; eye 2⅘ to 4¼, 1¾ in snout, 1½ in interorbital, greater than snout or interorbital in young; maxillary ⅔ to eye, reaches eye in young, $3\frac{1}{10}$ to 3⅓ in head; teeth compressed, uniserial, ends little attenuate; interorbital 3 to 3¼ in head, little convex; infraorbital and hind preopercle edge strongly dentate. Gill rakers 12+22, lanceolate, slender, rather long.

Tubes in lateral line 17 or 18, pores in straight section 7+1 or 2; 4 scales above lateral line, 9 below, 19 predorsal; 5 rows of cheek scales, 4 in young, none on infraorbital. Scales with 9 or 10 basal radiating striae; apical denticles 92 to 227, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XIII, 13, 1 or 14, 1, thirteenth spine 1⅔ to 1⅘, eighth ray 3⅖ to 3⅘ in combined head and body, first ray often simple; A. II, 12, 1 to 14, 1, second spine 1⅞ to 2 in head, eighth ray 1⅕ to 1¼, first ray sometimes simple; least depth of caudal peduncle 1⅔ to 2; caudal

emarginate, broad, 2⅗ to 2⅔ in combined head and body; pectoral 3¼ to 3½; ventral 3⅛ to 3⅖.

Body dark brown, little paler below. Cheeks, opercles and occiput with small gray-blue dots. Blue line across front of interorbital from one eye to the other; another line from front of snout to eye and parallel on infraorbital; another across maxillary end to postocular; also short one behind maxillary end, sometimes across lower chin. Each scale with traces of pale or whitish vertical line. Iris brownish. Small blue dots scattered about anal base and on breast and prepectoral region. Most examples show 3 large blotches or cloudings on back, ill-defined or obscure, first at front of spinous dorsal, second median below spinous dorsal and third below soft dorsal. Upper scale of opercles, at beginning of lateral line dusky. Fins all brownish, with paired ones often little paler. Spinous dorsal with submarginal broad gray band and another on lower terminal portion of anals longitudinally. Pectoral axil blackish, only very little exposed at pectoral origin.

We have all gradations of the young. Examples 40 to 50 mm. or less all show a large black ocellus, with whitish border on last dorsal spines. The larger of these frequently have a broad pale triangular band from antero-median dorsal spine to post-ventral and sometimes a pale or white transverse area from last part of soft dorsal to similar part of soft anal. In these examples the pectoral axil is not darker than surrounding area. The very young have the white bands more sharply defined, though the front one always a little wider, sometimes double as wide. Also they have a large dorsal ocellus, which may extend on the back slightly. They bear some resemblance to Bleeker's figure of *Dischistodus notophthalmus*, but differ at once in the posterior white band placed opposite the beginning of the caudal peduncle.

Nicobars, East Indies. A handsome species, greatly suggestive of *Pomacentrus lividus*, from which it may be distinguished at all ages by the absence of infraorbital scales.

We unite the nominal *Dischistodus cartieri* of Bleeker, based on the imperfect notice by Cartier of an example 63 mm. It is described as light brown, with a broad black blotch on the back at the last six dorsal spines, and is said to have a white line and the vent black. D. XIII, 12; A. II, 12.

12991. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 167 mm.
1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 92 mm.
1 example, Bolalo Bay. December 31, 1908. Length, 48 mm.
11071. Butauanan Island. June 13, 1909. Length, 112 to 153 mm. 2 examples.
7 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 170 mm.
12443 to 12445. Bugsuk Island, Balabac. January 5, 1909. Length, 103 to 135 mm.

188. Busin Harbor, Burias Island. March 8, 1909. 4 examples. Length, 112 to 150 mm. [299 to 301.] Olive-green, darkest and most distinctly green in two areas; one from shoulder to middle of spinous dorsal, and another below base of soft dorsal; scales with narrow purplish central bar, below paler; vent black, in bright ultramarine blue annulus; small black blotch at upper angle of opercle. Dorsal color of adjacent region, becoming almost drab distally and narrowly margined with blue. Caudal smoky. Anal with greenish shades, band of dusky-green across front and margin, this with narrow blue borders. Ventral very pale green. Pectoral hyaline, axil black, base with yellowish bar. Iris dusky with narrow ring of golden, purplish shades above.

5 examples, Caiholo River, Ulugan Bay, Palawan Island. December 29, 1908. Length, 53 to 69 mm.

6 examples, Candaraman Island, Balabac. January 4, 1909. Length, 114 to 125 mm.

1 example, Casogoran, Malhon Island. July 27, 1909. Length, 130 mm. [1707.]

943 and 944. Cebu market. April 5, 1908. 5 examples. Length, 15 to 60 mm.

5381. Cebu market. April 6, 1908. Length, 193 mm. Olivaceous, dusky above and paler below, otherwise more or less uniform; scales above base of anal showing slightly purplish at bases; obscure dark lines at centers of scales above and below lateral line anteriorly; lower part of head with somewhat lavender shades; very thin white line curving forward in front of interorbital region, broken into sparse white spots on upper orbit; similar line across preorbital in front of middle of eye; another from even with hinder edge of eye to lower corner of preorbital; cheek scales with paler centers and all of lower head including throat and chin with numerous spots and small blotches; centers of scales of breast with small obscure white spots; dorsal body color, more dusky, with slight purplish shade on terminal portion of spinous part; narrow white line at tip of spinous membrane resting on dark; caudal body-color, slightly dusky at tip; anal dusky-olive; vent black; ventral dusky-olive; pectoral dusky-hyaline, axil black; iris golden marked with flake of purple.

3 examples, Cebu, reef opposite. April 7, 1908. Length, 17 to 43 mm. [512 and 513.] Pale slaty; vertical bar on side width of pupil, slightly within tip of extended pectoral; lower parts and caudal peduncle paler, scales of breast and belly with pale edges; head colored as body; dorsal colored similarly to body, vertical bar of latter expanding as pale area on fin; distal portion of soft fin pale, slightly washed with chrome; tips of spinous membranes black; caudal pale chrome; anal similar to body, vertical portion distally pale; ventral pale slaty; pectoral hyaline yellow; iris dark; axil and base of pectoral somewhat dusky. Traces of black blotch under last dorsal spine; small black blotch in axil of dorsal; pale spot behind dorsal on caudal peduncle. [514.] Olive; the lower region slightly paler; a white bar about 2d to 5th dorsal spines downward narrowing and fading behind pectoral; somewhat diffuse on the fin; more obscure bar from axil of dorsal to anal; a black ocellus about the size of eye on the middle of dorsal extending on to scaled base, rim sulphur-yellow and vertical portion of soft fin and all caudal same. Anal like body, slightly paler in vertical edge. Pectoral hyaline. Ventral dusky. Ocellus in very small specimen orange.

1 example, Endeavor Strait. December 24, 1908. Length, 98 mm.

14381 and 16999. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length 120 to 160 mm.

8 examples, Great Tobea Island. December 15, 1909. Length, 19 to 35 mm.
14352. Limbones Cove. February 8, 1909. Length, 183 mm.
14990. Makesi Island, Palawan. April 5, 1909. Length, 158 mm.
12276 and 12277. Masbate reef, Masbate. April 20, 1908. Length, 155 to 164 mm.
2 examples, Malcochin Harbor, Linapacan Island. December 19, 1908.
1 example, Pandanon Island. March 23, 1909. Length, 38 mm.
19525. Pandanon Island. March 24, 1909. 3 examples. Length, 45 to 64 mm. [1475.]
1 example, Philippines. Length, 128 mm.
11059. Port Jamelo, Luzon. July 13, 1908. Length, 158 mm.
1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 158 mm.
12223 and 12224. Santa Cruz Island, Marinduque. April 24, 1908. Length, 163 to 176 mm.
12162 and 12163. Sirinao Island, Nakoda Bay near Alfonso XIII. December 30, 1908. Length, 160 mm.
19212. Tapiantana Island. September 13, 1909. Length, 128 mm.
1 example, Tataan, Simaluc Island. February 18, 1908. Length, 120 mm.
5 examples, Tobea Island. December 15, 1909. Length, 9 to 32 mm.
1 example, Tulayan Island. September 15, 1909. Length, 124 mm.
11681. Tutu Bay, first anchorage, Jolo Island. September 19, 1909. Length, 130 mm.
10994 to 10996. Ulugan Bay, north of Oyster Inlet. Length, 147 to 158 mm.
56273 U.S.N.M. Luzon. Philippine Commission. 1 example. Length, 130 mm.

POMACENTRUS NOTOPHTHALMUS Bleeker

Pomacentrus notophthalmus Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 137. Ternate.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 20 (East Indies).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173, (Singapore and Ceylon).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (New Guinea).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Dischistodus notophthalmus Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 402 (3), fig. 4; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 82 (Singapore, Celebes, Sangi, Ternate, Buru, Goram).—Weber, Siboga Ex., vol. 57, Fische, 1913, p. 340 (Nusa Laut Island).

Pomacentrus melanotus Bleeker, Act. Soc. Ind. Néerl. (Vis. Celebes), vol. 3, 1857–8, p. 13. Manado, Celebes.

Pomacentrus montrouzieri Thiollière, Faun. Woodlark, 1857, p. 200. Woodlark Island.

Pomacentrus kumkum (Montrouzier) Thiollière, Faun. Woodlark, 1857, p. 200 (name in synonymy).

Pomacentrus suluensis Seale, Philippine Journ. Sci., vol. 4 (6), 1909, p. 519. Sitanki Island, Jolo Archipelago.

Depth 2⅛ to 2⅕; head 3¼ to 3⅔, width 1¾ to 1⅞. Snout 2⅞ to 3; eye 3¼ to 3½, 1 to 1⅕ in snout, 1 to 1⅕ in interorbital; maxillary ¾ to ⅘ to eye, 3⅖ to 3⅘ in head; teeth compressed, form even cutting edge, crowded close as double row above, otherwise uniserial; interorbital 2⅗ to 3⅛, broad, convex; infraorbital and hind preopercle edges coarsely serrate. Gill rakers 8 + 15, lanceolate, long.

Tubes 16 to 18 in lateral line, pores in straight section 6 or 7 + 1 or 2; 3 or 4 scales above lateral line, 10 below, 21 to 27 predorsal; 3 rows of cheek scales, none on infraorbital. Scales with 8 to 10 basal radiating striae; apical denticles 152 to 165, with 1 or 2 series of basal elements; circuli fine.

D. XIII or XIV, 13, 1, thirteenth spine 1½ to 1⅗ in head, fifth ray 1$\frac{1}{10}$ to 1⅕; A. II, 13, 1, second anal spine 1⅗ to 1⅞, sixth anal ray 1⅙ to 1¼; least depth of caudal peduncle 1⅞ to 2; caudal deeply emarginate, lobes rounded, 2½ to 3 in combined head and body; pectoral 3½ to 4; ventral 3⅓.

Generally brownish on back and paler or whitish below. Head above and front of back for area obliquely up and embracing spinous dorsal deep brown. Upper corner of opercle with dusky ocellus vertically and not quite large as pupil. Very pale brownish bar from snout tip to eye, embracing nostril in its course. Pale obsolete streak from above pectoral base back toward center of caudal base. Vent in large deep-brown area, extends back over spinous anal and front of soft anal as obsolete dark streak. Fins otherwise pale. Iris dull neutral.

Ceylon and East Indies. A very handsome species, showing a fairly constant design in the white blotches on the head. These, together with its other combinations, especially in the large deep-brown blotch at the vent, will easily distinguish the species.

1 example, Bugsuk Island, Balabac. January 5, 1909. Length, 98 mm.
9 examples, Candaraman Island. January 4, 1909. Length, 88 to 120 mm.
2 examples, Cuyo, Cuyo Island. April 9, 1909. Length, 111 to 112 mm.
1 example, Dalaganem Island. April 8, 1909. Length, 133 mm.
1 example, Guntao Island. December 20, 1908. Length, 122 mm.
13085 and 13086. Kapoposang Island. December 28, 1909. 4 examples. Length, 109 to 130 mm. [2178.]
1 example, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 110 mm.
1 example, Mompog Island. March 3, 1909. Length, 88 mm.
11309. Palag Bay vicinity, Luzon. January 16, 1909. Length, 116 mm.
5897. Polloc, Mindanao. May 22, 1908. Length, 125 mm.
14161 to 14163. Pujada Bay, East Mindanao. May 15, 1908. 5 examples. Length, 100 to 126 mm.
5397. Ragay River tidewater, Ragay Gulf. March 10, 1909. Length, 125 mm.
10891. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 110 to 130 mm. 2 examples. [599.] Top of head and back anteriorly dark olive, set off by oblique obscure brassy line from the dusky gray of posterior and lower side; caudal peduncle and under soft dorsal with drab shades; large black blotch about vent, immediately ultramarine blue; breast dusky brassy, lower head same; cheek and opercle with peach-red blotches, these with minute purplish mottlings; blue-black blotch at upper angle of opercle; scales at top of head with pale radiating lines. Dorsal color of adjacent body, with inframarginal obscure band of paler, leaving margin of dark olive; very narrowly so on the soft portion. Front and anterior margin of anal olive,

spines blackish, remainder of fin body color; like dorsal with more drab posteriorly. Caudal narrowly blue at upper edge, dusky at lower, fin grayish. Ventral somewhat drab, front dusky. Pectoral dusky hyaline. Iris narrowly golden, purplish below.

14210 and 14211. Taganak Island. January 7, 1909. Length, 122 to 125 mm.
14384. Talisse Island. November 9, 1909. Length, 132 mm.
4 examples, Tara Island. December 14, 1908. Length, 126 to 132 mm.
11109 and 11110. Tara Island. December 15, 1908. Length, 130 mm.
14337. Tobea Island. December 14, 1909. Length, 98 mm.
1 example, Tulnalutan Island. September 9, 1909. Length, 154 mm.
2 examples, Ulugan Bay, channel north of Oyster Inlet. December 28, 1908. Length, 118 to 130 mm.
14521. Ulugan Bay, Rita Island. December 29, 1908. Length, 130 mm.
48623 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 102 mm.

POMACENTRUS PRISTIGER Valenciennes

Pomacentrus pristiger Valenciennes, Hist. Nat. Poiss., vol. 9, 1833, p. 506. Mauritius.—Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 425, pl. 46, fig. 4 (type).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Cuyo).

Pomacentrus chrysopoecilus (Kuhl and Van Hasselt) Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 21, pl. 5, fig. 3, Java.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 20 (East Indies and type of *P. notostigmus*).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Pulo Brani, Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Cebu).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 271 (Ambon).

Pomacentrus chrysopocitus Elera, Cat. Fauna. Filip., vol. 1, 1895, p. 545 (Cebu).

Dischistodus chrysopoecilus Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 406 (7), fig. 9.—Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 84 (Singapore, Pulu Brani, Java, Bawean, Celebes, Buru, Amboina, Ceram, Goram, Guebe).

Pomacentrus (*Dischistodus*) *chrysopoecilus* Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 440 (Batjan).

Pomacentrus notostigmus Richardson, Zool. Voy. Sulphur, Fish., 1844, p. 89, pl. 44, figs. 1–4. Southern Pacific.

Depth 2 to 2⅙; head 2⅔ to 3⅗, width 1⅛ to 1¾. Snout 2⅞ to 3¼; eye 3 to 3⅘, 1 to 1⅓ in snout, 1⅛ to 1⅕ in interorbital or little more than interorbital in young; maxillary not quite reaching eye, reaches eye in young, 3¼ to 3½ in head; teeth uniserial, compressed, ends little pointed; interorbital 2⅞ to 3¼, broadly convex; infraorbital and hind preopercle edge coarsely denticulate. Gill rakers 6 to 8+12 or 13, lanceolate, moderate.

Tubes in lateral line 17 or 18, sometimes followed by 3 or 4 irregular pores; pores in straight section 7 or 8+0; 3 to 5 scales above lateral line, 9 or 10 below, 13 to 24 predorsal forward till opposite front eye edge or nostril; 4 rows of cheek scales and none on infraorbitals. Scales with 7 to 10 basal radiating striae; apical denticles 104 to 161, with 1 or 2 series of basal elements, circuli fine.

D. XIII, 14, 1 or 15, 1, thirteenth spine 1⅔ to 2⅛ in head, seventh ray 1⅛ to 1⅖; A. II, 13, 1, second spine 1⅞ to 2¼, eighth ray 1⅕ to 1½; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅛ to 1¼; ventral 1 to 1⅛; caudal emarginate, lobes rounded, 2⅞ to 3⅕ in combined head and body.

Largely uniform brown, sometimes pectoral and caudal variously paler. Iris brown. Opercular scale at beginning of lateral line mostly neutral to blackish, less than pupil in diameter. On back above lateral line always conspicuous white spot, opposite middle in length of spinous dorsal and usually above lateral line, variable or sometimes extends scale below lateral line. Variously blue or blue-white lines on head below eye on infraorbitals. Eye brown to dusky, with narrow yellowish ring around pupil. Usually gray-white line from snout tip and along front of upper lip to lower eye edge and back across opercle above to below blackish opercular scale. Often another shorter from equal space above nostril to upper eye edge and then for several scales behind eye. One, and sometimes 2 white lines may cross chin, upper of which across maxillary may form infraorbital line. Scales on cheek, humeral and predorsal regions, also bases and greater portions of vertical fins or where scaled, finely spotted with blue or whitish. Each scale on body usually with median blue or white vertical line. Small dusky-brown spot at pectoral origin or in some cases entire pectoral axil blackish-brown. Fins otherwise all uniform dull brown. Ventral often darker than pectoral, with blue white line on first ray, then also on terminal portions of second and third rays. Vent often blackish.

Mauritius to the East Indies. Known by its somber coloration, with the diagnostic white spot conspicuously on the middle of the back. The young greatly resemble the young of *Pomacentrus littoralis*, but are easily distinguished by the naked muzzle and white spot on middle of back. Sometimes the white spot not very evident in bleached examples.

We adopt *Pomacentrus pristiger* Valenciennes as the earliest available name for the species, in place of the usually accepted and later *Pomacentrus chrysopoecilus* (Kuhl and Van Hasselt) Schlegel and Müller.

12440, 12441, 12442, 14799. Bugsuk Island, Balabac Island. January 5, 1909. 7 examples. Length, 93 to 128 mm.
2193. Cagayan. June 8, 1909. Length, 58 mm.
15040 and 15046. Calangaman Island. March 16, 1909. Length, 134 to 138 mm.
5423. Candaraman Island, Balabac. January 4, 1909. Length, 148 mm.
5422. Cebu market. April 7, 1908. Length, 144 mm.
7431. Dalaganem Island. April 8, 1909. Length, 120 mm.
25 examples, Great Tobea Island. December 15, 1909. Length 30 to 135 mm.
1039. Masamat Bay. June 12, 1909. Length, 22 mm.

1 example, Nogas Point, Panay Island. February 4, 1908. Length 29 mm. [5.]
3 examples, Pandanon Island. March 23, 1909. Length, 48 to 53 mm.
22903 and 22904. Romblon reef. March 26, 1908. Length, 94 to 102 mm. [484 and 485.] Dark olive-green, scales purplish at bases posteriorly; breast and anterior showing more of yellowish wash; chin and throat purplish; top of head with dusky-purple shades; black spot at upper corner of opercle; yellowish blotch about middle of back at base of dorsal; fins all dusky, becoming blackish distally.
19533 and 19535. Singaan Island. September 21, 1909. Length, 120 to 128 mm.
12 examples, Sirinao Island. December 31, 1908. Length, 37 to 43 mm.
1 example, Tataan, Simaluc Island. February 18, 1908. Length, 48 mm.
3 examples, Tataan. February 20, 1908. Length, 47 to 85 mm.
7 examples, Tobea Island. December 15, 1909. Length, 40 to 69 mm.

POMACENTRUS FASCIATUS Cuvier

Pomacentrus fasciatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 426, pl. 134. Java.—Schlegel and Müller, Verh. Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 20, pl. 4, fig. 1 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 19 (Philippines and Ceram).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Pulo Brani, Singapore).—Klunzinger, Sitz. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 397 (Port Darwin).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 544 (C. de Cebu).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Ticao Island).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 341 (Sanguisiapo, Sulu Archipelago, Kangeang, Nusa Laut, Banda, Rotti).

Dischistodus fasciatus Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 401 (2), fig. 8; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 86 (Singapore, Pulu Brani, Java, Bawean, Celebes, Sumbawa, Timor, Halmahera, Buru, Amboina, Ceram, Philippines).—Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 127 (Saonek).

Pomacentrus fasciatus var. *intermedia* Weber, Siboga Exp., vol. 57, Fische, 1913, p. 340, pl. 6, fig. 4. Sanguisiapo, Sulu.

Depth 2 to $2\frac{1}{10}$; head 3 to $3\frac{1}{4}$, width $1\frac{3}{5}$ to $1\frac{3}{4}$. Snout 3 to $3\frac{2}{3}$; eye $2\frac{7}{8}$ to $3\frac{1}{3}$, $1\frac{1}{5}$ in snout, $1\frac{1}{5}$ in interorbital, greater than snout or interorbital in young; maxillary reaches to or little beyond front eye edge, $3\frac{1}{5}$ to $3\frac{1}{3}$ in head; teeth uniserial, compressed, ends slightly rounded; interorbital $2\frac{7}{8}$ to $3\frac{2}{5}$, broadly and but slightly convex; infraorbital and hind preopercle edges coarsely serrate, former nearly entire in young. Gill rakers 8+12, lanceolate, rather short and robust.

Tubes in lateral line 18 or 19, pores in straight section 7 or 8+1; 3 scales above lateral line, 10 below, 12 to 15 predorsal; 3 rows of cheek scales and none on infraorbital or preopercle flange. Scales with 8 or 9 basal radiating striae; apical denticles 73 to 158, with 1 to 7 transverse series of basal elements; circuli very fine.

D. XIII, 12, 1 or 13, 1, thirteenth spine 2 in head, sixth ray $1\frac{1}{3}$ to $1\frac{4}{5}$; A. II, 13 1, second spine 2 to $2\frac{1}{8}$, sixth ray $1\frac{1}{3}$ to $1\frac{1}{2}$;

caudal 1 to $1\frac{1}{10}$, broad, slightly emarginate; least depth of caudal peduncle $1\frac{7}{8}$ to 2; pectoral $1\frac{1}{10}$ to $1\frac{1}{6}$; ventral $1\frac{1}{10}$ to $1\frac{1}{8}$.

Brownish generally, paler to whitish below. At occiput whitish band, 2 or 3 scales in width, down vertically to lower edge of gill-opening, entirely behind eye and below and behind preopercle angle. Second white band from front of spinous dorsal down till little behind pectoral base. Third white band from bases of last dorsal spines and fourth on front of caudal behind soft dorsal base or sometimes including few of last dorsal rays. Iris yellowish. Gray line from side of snout in front to eye. Gray bar on infraorbital fading behind. Scales on cheek and opercle all with traces of gray spot. At suprascapular and for several rows of scales posteriorly on upper costal region, dusky black spot at base of each scale. Dorsals largely brownish, with broad submarginal whitish band on spinous fin. Anals deep brown to dusky marginally and ill-defined pale submarginal streak or band. Caudal pale brown, often little darker terminally and upper edge frequently diffused whitish. Pectoral brown. Ventral dusky brown, paler basally.

East Indian region.

24 examples, Batan Island. July 22, 1909. Length, 40 to 50 mm.
10 examples, Canimo Island, near Daet. June 15, 1909. Length, 24 to 100 mm.
2 examples, Cebu Island, reef opposite Cebu. April 5, 1908. Length, 39 to 55 mm. [504.] Black and sulphur-yellow, soft dorsal and ventral with pale orange wash.
3 examples, Cebu, reef opposite. April 7, 1908. Length, 35 to 43 mm.
41 examples, Great Tobea Island. December 15, 1909. Length, 18 to 117 mm.
12532. Jolo market. February 13, 1908. Length, 120 mm.
19323 and 19324. Jolo market. March 6, 1908. Length, 87 to 99 mm.
11 examples, Pilas Island. September 12, 1909. Length, 9 to 54 mm.
22700. Port Caltom. December 15, 1908. Length, 78 mm.
20325. San Pascual, Burias Island. March 8, 1909. Length, 104 mm.
19678. Santa Cruz Island, Marinduque. April 5, 1909. Length, 95 mm.
5 examples, Simaluc, Bisibisi Island. September 23, 1909. Length, 65 to 86 mm.
1 example, Sirinao Island. December 31, 1908. Length, 38? mm.
1 example, Surigao, Mindanao. May 8, 1908. Length, 20 mm.
2 examples, Tataan, Simaluc Island. February 18, 1908. Length, 39 to 93 mm.
2 examples, Tataan. February 20, 1908. Length 90 to 115 mm.
20 examples, Tobea Island. December 15, 1909. Length, 21 to 56 mm.

POMACENTRUS OVOIDES Cartier

Pomacentrus ovoides Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 98. Bohol and Cavite, Philippines.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 544 (Luzon, Cavite, Santa Cruz, and Bohol).

Pomacentrus philippinus Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 91, fig. 18 (Bacon, Sorsogon).

Depth 2 to $2\frac{1}{8}$; head $3\frac{1}{4}$ to 4, width $1\frac{2}{5}$ to $1\frac{3}{4}$. Snout 4 to $4\frac{1}{8}$; eye $2\frac{7}{8}$ to 3, $1\frac{1}{10}$ in interorbital, greater than snout or interorbital

in young; maxillary reaches little beyond front of eye, 3 to 3⅛ in head; teeth uniserial, compressed, ends rounded or obtuse; interorbital 2⅞ to 3, broadly convex; infraorbital with obtuse spine in front and rest of edge entire; preopercle edge serrate behind, feebly so in young. Gill rakers 7+14, lanceolate, rather long, slender.

Tubes in lateral line 16 or 17, pores in straight section 7+0 to 2; 3 scales above lateral line, 9 below, 20 to 23 predorsal, which extend forward to near snout end; 5 rows of cheek scales of which uppermost narrow row on infraorbital. Scales with 8 or 9 basal radiating striae; apical denticles 114 to 116, with 3 or 4 transverse series of basal elements; circuli fine.

D. XIII, 12, 1 or 13, 1, thirteenth spine 1⅞ in head, sixth ray 1⅛ to 1⅗; A. II, 13, 1, second spine 1⅔ to 1¾, sixth ray 1⅛ to 1⅓; least depth of caudal peduncle 1⅘ to 1⅞; caudal emarginate, 3 to 3¼ in combined head and body; pectoral 2⅞ to 3⅕; ventral 2⅗ to 3.

Body largely deep brown to rich chocolate, head variously paler or more brownish. Iris brown. Obscure small dark blue spots scattered over head. Dorsals and anals dusky to blackish, except last half of dorsal and posterior part of anal strongly contrasted yellowish-white. Caudal peduncle fades paler behind into yellowish-white caudal fin. Pectoral brownish, with large black basal blotch, which not quite extended entirely below externally, though over all of axil internally. Ventral dusky-black.

Known only from the East Indies and Philippines. A very handsome species, well marked by its dark and light contrasted colors. The description of Cartier seems to us to be identifiable with our material, to which we unite *Pomacentrus philippinus* as a synonym. The account by Cartier is somewhat as follows:

Depth less than 2½; head less than 4; eye more than snout; preorbital entire; caudal forked, lobes elongated filaments; D. XIII, 12, A. II, 13. Brown, brighter below, scales with clearer edges; forehead blue; light blue spots on opercle. Vertical fins brown, partly black; dorsal and anal bases clear, especially posteriorly with white blotch. Round black spot in upper pectoral axil. Length 90 to 100 mm.

1 example, Dalaganem Island. April 8, 1909. Length, 91 mm.
3 examples, Danawan Island and Si Amil Island. September 27, 1909. Length. 62 to 92 mm.
14437. Gubat, Sorsogon, Luzon. June 23, 1909. Length, 79 mm.
1 example, Murcielagos Bay. August 9, 1909. Length, 95 mm.
1 example, Nasugbu, Luzon. January 16, 1908. Length, 98 mm.
10 examples, Paluan Bay, Mindoro. December 11, 1908. Length, 67 to 86 mm.
15123, 15126 to 15129, 15130, 15136 and 16137, 15139 to 15144. Port Dupon, Leyte Island. March 17, 1909. Length, 68 to 83 mm.
8 examples, Pujada Bay, Mindanao. May 15, 1908. Length, 69 to 84 mm. [621 to 624.] Brown; distal portion of caudal and vertical edges of anal and dorsal cadmium-yellow to orange; base of pectoral black.
1 example, Sablayan, Mindoro. December 12, 1908. Length, 66 mm.

1 example, Tifu Bay, Bouro Island. December 10, 1909. Length, 96 mm.
1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 94 mm.
55901 U.S.N.M. Bacon. Philippine Commission. Length, 73 mm. Type of *Pomacentrus philippinus.*

POMACENTRUS BREVICEPS (Schlegel and Müller)

Glyphisodon breviceps SCHLEGEL and MÜLLER, Verh. Nat. Ges. Nederl. Zool., 1839–1844, p. 23. Indian Ocean, southwest coast of Sumatra.
Glyphidodon breviceps GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 42 (copied).
Amblypomacentrus breviceps BLEEKER, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 7; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 69 (Sumatra, Bawean, Celebes, Sumbawa, Timor, Halmaheira, Ternate, Buru, Ceram, Amboina).
Pristotis trifasciatus BLEEKER, Journ. Indian Arch., vol. 2, 1848, p. 637. Sumbawa.
Pomacentrus nematopterus BLEEKER, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 285. Amboina.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 42 (East Indies).

Depth 2⅕ to 2⅓; head 2⅘ to 3, width 1¾ to 2. Snout 4¾ to 4⅘; eye 2⅖ to 2⅘, greater than snout or interorbital; maxillary reaches opposite front pupil edge, 2⅔ to 3 in head; teeth compressed, uniserial, ends obtuse; interorbital 3⅛ to 3¼, broadly convex; infraorbital edge and hind preopercle edge finely serrate. Gill rakers 8+15, lanceolate, slender, long.

Tubes in lateral line 15 to 17, pores in straight section 8 or 9+0 to 2; 3 scales above lateral line, 8 below, 11 or 12 predorsal not quite forward far as front eye edge; 2 rows of cheek scales, none on infraorbital or preopercle flange. Scales with 6 or 7 basal radiating striae; apical denticles 60 to 88, with single series of basal elements; circuli very fine.

D. XIII, 11, 1 or 12, 1, thirteenth spine 2 to 2⅛ in head, fifth ray 1⅕ to 1⅖, first ray often simple; A. II, 11, 1 to 13, 1, second spine 1⅘ to $1\frac{9}{10}$, sixth ray 1¼ to 1⅓; least depth of caudal peduncle 2 to 2⅕; caudal emarginate, 2¾ to 2⅞ in combined head and body; pectoral 3½ to 3¾; ventral 2¾ to 2⅘.

Generally pale or whitish, each scale with grayish spot. Broad dusky brown band includes interorbital and eye down over cheek, not always reflected below on under surface of head. Second broad dusky brown saddle includes front of soft dorsal and front of back. Third broad dusky brown band includes last dorsal spines and back below. Fins all pale or whitish, except for dark saddles and some of rayed vertical fins with obscure brown mottlings. Some examples rather soiled or swarthy and in these iris now dark. In pale examples iris whitish.

East Indies. The submarginal dark line shown in Bleeker's figure not evident in our examples. Also Bleeker does not show the

dark blotches extending to the edges of the spinous dorsal fin and in none is the posterior dorsal blotch extended so far back or below the soft dorsal, as he indicates.

23 examples, Great Tobea Island. December 15, 1909. Length, 20 to 47 mm.
2 examples, Malcochin Harbor, Linapacan Island. December 15, 1908. Length, 34 to 40 mm.
28 examples, Malcochin Harbor. December 19, 1908. Length, 30 to 37 mm.
1 example, D. 5145. Near Jolo. February 15, 1908. Length, 43 mm.
1 example, Port Caltom. December 16, 1908. Length, 45 mm.
2 examples, Tataan, Simaluc Island. February 18, 1908. Length, 24 to 50 mm.
1 example, Tataan Island. February 20, 1908. Length, 36 mm.
20 examples, Tobea Island. December 15, 1909. Length, 20 to 38 mm.

POMACENTRUS BEAUFORTI, new species

Depth 2⅖ to 2½; head 2¾ to 3⅕, width 1½ to 2. Snout 4 to 4¾; eye 2⅗ to 3⅛, greater than snout or interorbital; maxillary reaches eye, 3 to 3¼ in head; teeth uniserial, compressed, truncate, form even cutting edge; interorbital 2⅞ to 3¼, broadly convex; lower infraorbital and hind preopercle edge minutely and evenly serrate. Gill rakers 9+15, lanceolate, slender, long.

Tubes in lateral line 15 or 16, pores in straight section 9 to 11+2 to 3; 3 scales above lateral line, 8 or 9 below, 13 or 14 predorsal; 2 rows of cheek scales and none on infraorbital or preopercle flange. Scales with 6 or 7 basal radiating striae; apical denticles 80 to 88, with 1 or 2 transverse series of basal elements; circuli very fine.

D. XIII, 10, 1 or 11, 1, thirteenth spine 2⅛ to 2⅙ in head, fifth ray 1 to 1⅘; A. II, 11, 1, second spine 1⅞ to 2$\frac{1}{10}$, seventh ray 1⅛ to 1¾; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅛ to 1⅕; ventral 1⅛ to 2⅘ in combined head and body; caudal 2⅓ to 3¼, deeply lunate.

Pale brown generally, becoming paler below and whitish on breast and belly. Most scales on body show traces of paler basal spot. Dusky brown band, little wider above, to eye and down below, crossing lower surface of head where paler. Second dusky-brown saddle at predorsal and front dorsal spine down to middle of side. Third dusky brown saddle at last dorsal spines and front of soft dorsal. Caudal base with rounded dusky brown blotch little larger than eye, present at all ages and very distinct. Iris brown. Lips pale. Dorsals pale brownish, spinous fin little darker and dorsal saddles well over fins. Edge of spinous dorsal distinctly darker than rest of fin, from which it is separated by paler submarginal band. Soft dorsal paler or even inclining to whitish behind with small brown spots on membranes basally. Anal whitish, with faint gray border and very pale brownish spots on membranes basally. Caudal whitish, also with faint brown spots on median membranes. Paired fins uniform whitish.

Confined to the Philippines. Remarkably close to *Pomacentrus breviceps* Bleeker, but differs at once in the conspicuous dark caudal blotch.

Type.—Cat. No. 89962, U.S.N.M.

4 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 48 to 53 mm.
1 example, Cataingan Bay, Dumurug Point, Masbate. April 19, 1908. Length, 58 mm.
110 examples, Catbalogon, Samar. April 15, 1908. Length, 23 to 87 mm. Types.
6 examples, Cebu market. March 28, 1909. Length, 40 to 66 mm.
3 examples, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 27 to 37 mm.

(For Dr. L. F. De Beaufort, in slight appreciation of his work on East Indian fishes.)

POMACENTRUS LIVIDUS (Schneider)

Chaetodon lividus (Forster) Schneider, Syst. Ichth. Bloch, 1801, p. 235. Pacific Ocean.

Eupomacentrus lividus Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 3; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 73 (Cocos Island, Sumatra, Singapore, Java, Celebes, Sangi, Buru, Amboina, Ceram, Goram).

Pomacentrus lividus Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 228, pl. 124, fig. 7 (Red Sea, East Africa, East Indies, Boston Island, Samoa, Upolu, Vavau, Huaheine, Ponape, Borabora, Santa Christina).—Day, Fauna British India, vol. 2, 1889, p. 385.—Sauvage, His. Nat. Madagascar, Poiss., 1891, p. 426.—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 439 (Batjan).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 783 (Negros).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 340 (Borneo Bank, Nuaras Reef, Beo, Liring, Damar, Timor).—Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 53 (Philippines); Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Pomacentrus punctatus Quoy and Gaimard, Voy. Uranie, Zool., 1824, pp. 395, 398, pl. 64, fig. 1. Mauritius.—Rüppell., Atlas Reise Nördl. Afr., Fisch., 1828, p. 37 (Red Sea).—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 429 (Borabora).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1865, p. 29 (copied); Fishes of Zanzibar, 1866, p. 82 (Zanzibar).—Kner, Reise Novara, Fisch., vol. 2, 1865, p. 242 (Tahiti and Nicobars).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 522 (Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 384, pl. 80, fig. 8 (Andamans).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Maldives; Surodiva and Haddumati).

Pomacentrus prosopotaenioides Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 286. Amboina.

Pomacentrus cyanospilos Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 709. Wahai, Ceram.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Cebu).

Pomacentrus cyanospilus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 30 (Amboina and East Indies).—Klunzinger, Sitz. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 397 (Port Darwin).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 545 (Luzon, Manila Bay, Mindoro, Cebu).

Pomacentrus obscurus THIOLLIÈRE, Faun. Woodlark, 1857, p. 200. Woodlark Island.

Pomacentrus kumkum (MONTROUZIER) THIOLLIÈRE, Faun. Woodlark, 1857, p. 200 (name in synonymy).

Pomacentrus obscurus (preoccupied above) ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 343, pl. 15., fig. 2. Exact locality (?)

Eupomacentrus albofasciatus (not SCHLEGEL and MÜLLER) BLEEKER, Atlas Ichth. Ind. Néerl, vol. 9, 1877, pl. 403 (4), fig. 6.

Pomacentrus vitianus SAUVAGE, Bull. Soc. Philom. Paris, ser. 7, vol. 3, 1878, p. 206. Fiji.

Pomacentrus trimaculatus (not VALENCIENNES) EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906, p. 89 (Bacon).

Pomacentrus prosopotænia (not BLEEKER) FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 45 (Zamboanga).

Depth 2 to 2⅕; head 2⅘ to 3⅛, width 1½ to 1⅞. Snout 2⅘ to 3; eye 3 to 4⅘, 1 to 1¾ in snout, 1½ in interorbital to greater than interorbital; maxillary reaches ⅔ to eye, nearly reaches eye in young, 3⅓ to 3⅘ in head; teeth uniserial, compressed, truncate; interorbital 3 to 3⅖, broadly convex; infraorbital and preopercle edge strongly dentate. Gill rakers 10+18, lanceolate, slender, short.

Tubes in lateral line 16 to 17, pores in straight section 7 or 8+0 to 1; 3 or 4 scales above lateral line, 9 below, 18 to 20 predorsal, only extend forward to nostril; snout, preorbital and muzzle naked; 2 rows of small scales on infraorbital and 3 or 4 rows of mostly large scales below on cheek. Scales with 8 to 10 basal radiating striae; apical denticles 85 to 119, basal elements in 1 to 3 series; circuli fine.

D. XI or XII, 15, I or 16, I, twelfth spine 2 to 2⅛ in head, seventh ray 1⅛ to 1½, first ray sometimes simple; A. II, 13, I, second spine 2⅕ to 2⅓, sixth ray 1½; caudal emarginate, lobes rounded, 1⅕ to 1⅓; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅖; pectoral 1⅕ to 1⅓; ventral 1 to 1¼.

Back umber brown, paler on sides of head and below, breast and abdomen. Each scale with small blue gray spot on trunk and tail, larger and more pronounced on cheek and opercle, especially in young. Usually a diffuse dusky brown blotch or shade at last dorsal rays basally and on tail adjacent sometimes. Iris brownish. Fins all dull brown, dorsals and ventrals usually darker or inclining to dusky.

Mauritius, East Africa and Red Sea to the East Indies and Society Islands. Well distinguished by the naked muzzle, robust appearance, with dark coloration finely dotted with pale blue.

11682, 12202, 14798, Bugsuk Island, Balabac. January 5, 1909. Length, 135 to 142 mm.

15041, 15045, 15048, and 15049. Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 125 to 143 mm.

7 examples, Candaraman Island, Balabac. January 4, 1909. Length, 125 to 142 mm.

1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 87 mm.
13172 and 13174. Cataingan Bay. April 17, 1908. Length, 98 to 103 mm.
8 examples, Cataingan Bay. April 18, 1908. Length, 102 to 138 mm.
13515. Gomomo Island. December 3, 1909. Length, 120 to 145 mm.
8 examples, Little Santa Cruz Island. May 28, 1908. Length, 85 to 130 mm.
11347 and 15105. Mompog Island. March 3, 1909. Length, 130 mm.
2 examples, Morongas Island. February 10, 1908. Length, 32 to 34 mm.
2 examples, Philippines. Length, 104 to 107 mm.
19236. Rasa Island, Mantaquin Bay. April 1, 1909. Length, 144 mm.
14044 and 14045. Sacol Island. September 9, 1909. 3 examples. Length, 117 to 128 mm.
4 examples, Tataan, Simaluc Island. February 20, 1908. Length, 120 to 152 mm.
6 examples, Tomahu Island. December 11, 1909. Length, 31 to 56 mm.
24139. Tomahu Island. December 12, 1909. Length, 35 mm.
2 examples, Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 54 to 62 mm.
19045. Varadero Bay, Mindoro. July 23, 1908. Length, 150 mm.
7 examples, Apra Bay, Guam. November 19–21, 1907. Length, 75 to 125 mm.
52376 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 11 examples. Length, 42 to 135 mm.
56273 U.S.N.M. Bacon. Philippine Commission. Length, 127 mm. As *Pomacentrus trimaculatus.*
65991 U.S.N.M. Kusaie. *Albatross* Collection. Length, 85 mm.
84235 U.S.N.M. Zamboanga. Dr. F. Baker. Length, 160 mm. As *Pomacentrus prosopotaenia.*
31522–30 A.N.S.P. Apia. Bureau of Fisheries. Length, 77 to 100 mm.
9651 A.N.S.P. Samoa. Dr. H. C. Caldwell. Length, 75 mm.
48726–27 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 55 to 62 mm.

POMACENTRUS NIGRICANS (Lacépède)

Holocentrus nigricans Lacépède, Hist. Nat. Poiss., vol. 4, 1803, pp. 332, 367. No locality (on Commerson).

Pomacentrus nigricans Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1846, p. 254 (China).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 262 (Calayan and Cagayancilo).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 504 (Okinawa).

Pomacentrus scolopseus Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 398. Mauritius.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 545 (Cebu).

Pomacentrus scolopsis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 28 (Fiji).

Pomacentrus taeniops Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 425. Mauritius Guam, Borabora.—Lesson, Voy. Coquille, Poiss., vol. 2 (1), 1830, p. 190 (not fig.).

Eupomacentrus (*Eupomacentrus*) *lividus* (not Schneider) Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 73 (part).

Pomacentrus subniger De Vis, Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 873. Cardwell, Queensland.

Depth 1⅞ to 2; head 3, width 1⅗ to 1⅔. Snout 3 to 3 1/10; eye 3 1/10 to 3¾, 1 to 1⅕ in snout, 1 to 1⅕ in interorbital; maxillary reaches little beyond front eye edge, not to pupil, 3¼ to 3⅖ in head;

teeth uniserial, compressed, truncate incisors; interorbital 3⅛ to 3¼ in head, broadly convex; suborbital and hind preopercle edge denticulate. Gill rakers 10+13, lanceolate.

Tubes in lateral line 18 or 19, pores in straight section 8 or 9 obsolete to caudal base; 3 scales above lateral line, 8 below, 27 to 29 predorsal extending slightly forward to nostril; soft vertical fins finely scaled and on soft dorsal scales extended far out on fin. Scales with 8 or 9 short basal radiating striæ; apical denticles minute, feeble, 142 to 150, with single row of basal elements; circuli fine.

D. XII, 16 or 17, seventeenth spine 1¾ in head, fourth ray 1 to 1¼; A. II, 13, second spine 1⅗ to 1¾, first ray 1⅖ to 1⅗; caudal 1 to $1\frac{1}{10}$, emarginate; least depth of caudal peduncle 2; pectoral 1⅛ to 1¼; ventral 1 to $1\frac{1}{10}$.

Dull olive generally, scarcely paler or with only slightly clouded brownish tinge below. Suborbitals conspicuously grayish. Fins brown. Ventrals tinged with more or less dusky. Small blackish spot at pectoral axil less than pupil in size. Another, slightly larger than pupil, at bases of last dorsal rays.

East Indies, China, Riu Kiu, Fiji. Distinguished by its color pattern, with the gray suborbitals and small black spot at pectoral origin and at bases of last dorsal rays.

14775. Bagacay Bay, Escarpada Island. March 13, 1909. Length, 150 mm.
2 examples, Butauanan Island. June 13, 1909. Length, 104 to 108 mm.
14800. Bugsuk Island. Balabac. January 5, 1909. Length, 130 mm.
15042. Calangaman Island. March 16, 1909. Length, 137 mm.
1 example, Candaraman Island, Balabac. January 4, 1909. Length, 104 mm.
2 examples, Casogoran, Malhon Island. July 27, 1909. Length, 108 to 128 mm. [1711.]. Blackish with purplish shades above anal; fins black, except spinous dorsal membranes, which have an olive shade; pectoral membranes hyaline, black spot showing on upper base; ventrals fading to olive and gray.
3 examples, Casogoran. July 27, 1909. Length 110 to 127 mm. [1723.] Dusky brownish or slaty. Blackish at bases of last dorsal rays and at pectoral bases. Fins darker than body.
21854. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 124 mm.
1 example, Galera Bay, Mindoro. June 9, 1908. Length, 60 mm.
1 example, Kapoposang Island. December 28, 1909. Length, 110 mm.
149, 17838 and 17839. Langao Point, Luzon. June 24, 1909. Length 110 to 145 mm. Central region of scales light, almost drab in some specimens, with distinct purplish shades on posterior half; narrow purple line under the eye on preorbital, orbital rim orange above and posteriorly; tips of spinous dorsal membrane paler than the rest of the fin; anal spines and rays with distinct purplish reflections.
12967. Langao Point. July 13, 1908. Length, 150 mm.
14693. Maculabo Island. June 13, 1909. Length, 115 mm.
14566. Maculabo Island. June 14, 1909. 2 examples. Length, 102 to 118 mm.
7317. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 122 mm.
2 examples, Nabatas Point, Damar. July 24, 1909. Length, 105 to 113 mm.
18. Pandanon Island. March 23, 1909. Length, 119 mm.
1 example, Philippines. Length, 116 mm.

14949, 14951 and 14952, 14955. Port Ciego, Balabac. January 3, 1909. Length, 119 to 125 mm.

1 example, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 100 mm.

2 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 110 to 128 mm.

19163. Santo Domingo de Basco, Batan Island. November 7, 1908. Length, 92 mm.

12 examples, Midway Islands, reefs. November 7, 1907. Length, 97 to 128 mm.

1723 [D. 5508]. North Lat. 8° 17′ 18″, East Long. 124° 11′ 42″ in 270 fathoms. August 5, 1909.

14129. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 127 mm.

1116. Nan Wan Bay, South Formosa. January 25, 1910. Length, 100 mm.

25 examples, Apra Bay, Guam. November 19–21, 1907. Length, 39 to 123 mm. 7033 to 7044 B. F.

45091 U.S.N.M. Samoa, S. G. Whitmee. 1 example. Length, 85 mm.

52430 U.S.N.M. Samoa, Bureau of Fisheries. 21 examples. Length, 32 to 118 mm.

65992 U.S.N.M. Makemo, Paumotus. *Albatross collection.* 5 examples. Length, 80 to 100 mm.

71599 U.S.N.M. Nafa, Okinawa. *Albatross collection.* 3 examples. Length, 88 to 130 mm.

72203 U.S.N.M. Calayan. R. C. McGregor 3 examples. Length, 22 to 89 mm.

9661 to 9662 A.N.S.P. Oahu, Hawaiian Islands. Dr. W. H. Jones.

31385 to 31405 A.N.S.P. Pago Pago, Samoa. Bureau of Fisheries. Length, 50 to 110 mm.

51173 to 51175 A.N.S.P. Pago Pago. Capt. C. F. Silvester.

Genus DAYA Bleeker

Daya Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3 vol. 2, 1877, p. 71. Type *Pomacentrus jerdoni* Day, monotypic.

Body oblong ovate. Front teeth in jaws little enlarged, compressed, tips conic; lateral teeth small. Infraorbitals narrow, little developed. Subopercle and interopercle edges finely serrate. Gill rakers 30 on first arch. Scales 30 to 34 in median lateral series. Muzzle naked. No scaly sheaths at bases of spinous dorsal and anal fins, membranes of these fins naked. Dorsal with 13 spines and 13 rays. Anal spines 2, rays 13 or 14.

East Indian region.

DAYA JERDONI (Day)

Pomacentrus jerdoni Day, Proc. Zool. Soc. London, 1873, p. 237. Madras; Fishes of India, pt. 3, 1877, p. 383, pl. 80, fig. 7; Fauna of British India, vol. 2, 1889, p. 385.—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 89 (Bulan).—Regan, Journ. Bombay Nat. Hist. Soc., vol. 16, pt. 2, 1906, p. 330 (Persian Gulf).

Daya jerdoni WEBER, Siboga Exp., Fische, vol. 57, 1913, p. 344 (Tongkil Island, Sulu Archipelago, Borneo Bank).—MCCULLOCH, Mem. Queensland Mus., vol. 7, pt. 3, November 4, 1921, p. 170, pl. 11, fig. 1 (Capricorn Group in 25 to 30 fathoms, types of *Pomacentrus dolii*).

Pomacentrus dolii MACLEAY, Proc. Linn. Soc. New South Wales, vol. 6, 1881, p. 65, pl. 1, fig. 1. Port Jackson.

Daya jerdoni var. *fusca* MCCULLOCH, Mem. Queensland Mus., vol. 7, pt. 3, 1921, p. 171, pl. 11, fig. 2. Queensland; vol. 8, pt. 2, July 7, 1925, p. 166 (Double Island Point, Cape Capricorn, Bustard Head Light, Hervey Bay, Bowen).

Depth 2⅗ to 2⅔; head 3⅗ to 3⅔, width 1⅘ to 1⅞. Snout 4 in head, measured from snout tip; eye 3 to 3½, greater than snout or 1 to 1⅛ in interorbital; maxillary reaches eye, 2⅓ to 2½ in head; teeth uniserial, obtuse, strong, larger forward in jaws; interorbital 2⅔ to 3 in head, broadly convex; infraorbitals and preorbital not free; hind preopercle edge finely dentate. Gill rakers 10+19, lanceolate, slender, moderate.

Tubes in lateral line 20; pores in straight section of lateral line 10 to 12 to caudal base and 2 more on latter; 4 scales above lateral line, 10 below, 17 predorsal forward opposite front eye edge; 5 rows of cheek scales. Scales with 9 or 10 basal radiating striae; apical denticles 94 to 117, with 2 or 3 series of basal elements transversely; circuli very fine.

D. XIII, 13, 1, thirteenth spine 2 to 2¼ in total head length, ninth ray 1¼ to 1¾; A. II, 13, 1, second spine 2⅘ to 3⅕, ninth ray 1¼ to 1½; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅕ to 1¼; ventral 1⅛ to 1⅓; caudal sharply forked, 2⅙ to 3⅖ in combined head and body.

Largely umber-brown, but little paler on lower surface of head and breast. Each scale with small, slightly darker brown spot. Iris brownish. Some pale spots on cheek and opercle, also on breast and abdomen. Vertical fins deep brownish terminally. Paired fins pale, with neutral dusky spot less than pupil at pectoral origin.

Persian Gulf, India, East Indies, Philippines, Queensland.

56111 U. S. N. M. Luzon. Philippine Commission. Length, 150 mm.
56112 U.S.N.M. Luzon. Philippine Commission. Length, 120 mm.
33250 A.N.S.P. Bulan, Luzon. Bureau of Fisheries. Length, 98 mm.

Genus ABUDEFDUF Forskål

Abudefduf FORSKÅL, Descript. Animal., 1775, p. 59. Type *Chaetodon sordidus* FORSKÅL, assumed through vernacular name.

Glyphisodon LACÉPÈDE, Hist. Nat. Poiss., vol. 4, 1803, p. 542. Type *Glyphisodon moucharra* LACÉPÈDE = *Chaetodon marginatus* BLOCH = *Chaetodon saxatilis* (part) LINNAEUS, designated by BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 91.

Gliphysodon DUMÉRIL, Zool. Analyt., 1806, p. (134) 336. Type *Chaetodon marginatus* BLOCH.

Glyphidodon GILL, Proc. Acad. Nat. Sci. Phila., 1862, pp. 145, 147. Type *Chaetodon marginatus* BLOCH.

Chrysiptera SWAINSON, Nat. Hist. An., vol. 2, 1839, p. 216. Type *Glyphisodon azureus* CUVIER = *Glyphisodon cyaneus* QUOY and GAIMARD, designated by SWAIN, Proc. Acad. Nat. Sci. Phila., 1882, p. 273.

Stegastes JENYNS, Voy. Beagle, Fish., 1842, p. 63. Type *Stegastes imbricatus* JENYNS, monotypic.

Euschistodus GILL, Proc. Acad. Nat. Sci. Phila., 1862, p. 145. Type *Euchistodus declivifrons* GILL, designated by JORDAN, Genera of Fishes, vol. 3, 1919, p. 315.

Amblyglyphidodon BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, p. 92. Type *Glyphisodon aureus* (KUHL and VAN HASSELT) CUVIER, orthotypic.

Paraglyphidodon BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, p. 116. Type *Paraglyphidodon oxycephalus* BLEEKER, designated by JORDAN, Genera of Fishes, vol. 3, 1919, p. 384.

Glyphidodontops BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, p. 128. Type *Glyphisodon azureus* CUVIER, virtually, as *Glyphidodontops* proposed to replace *Chrysiptera*.

Centrochromis NORMAN, Ann. Mag. Nat. Hist. London, ser. 9, vol. 9, 1922, p. 533. Type *Glyphidodon rudis* Poey, orthotypic.

Body deep, compressed, orbicular, ovate or ovate-oblong. Jaws equal or subequal. Teeth compressed, fixed, uniserial or irregularly biserial, incisor-like, lobulate or ends conic. Branchiostegals 5 or 6. Pyloric coeca 3. Scales 26 to 30 in median lateral series. Muzzle scaly or naked; infraorbitals and preopercle flange usually naked. Dorsal spines 12 or 13, rays 11 to 18. Anal rays 11 to 17. Caudal with or without filaments.

Species numerous in tropical seas, often abundant about coral reefs. We retain the smaller and elongated *Chrysiptera* Swainson simply as a subgenus. The genus doubtless had its center of dispersal in the East Indies. *Hemiglyphidodon*, associated by Bleeker with the present genus, we detach as distinct, due to the greatly increased gill rakers.

ANALYSIS OF THE SPECIES

a^1. Orbicular or deeply ovoid; transverse bands dark, usually more than 2 present; teeth entirely uniserial incisors.

b^1. ABUDEFDUF. Oblong-oval; 3 or 4 rows of scales above end of upper section of lateral line; body always with 5 to 7 dark transverse bands.

c^1. Snout scaly, predorsal scales extending forward to nostrils or anterior.

d^1. Caudal uniformly brown.

e^1. Dark vertical bands 5, wide as pale interspaces ..... saxatilis.

e^2. Dark vertical bands 7, much narrower than pale interspaces ..... bengalensis.

d^2. Each caudal lobe with blackish longitudinal band; dark vertical bands 5, wide as pale interspaces ..... sexfasciatus.

c^2. Snout scaleless, preorbital scales not extending forward to front eye edge; caudal uniform.

f^1. No dark spot at suprascapula or pectoral origin.

g^1. Infraorbitals scaleless; 6 dark obscurely defined vertical bands, much wider than interspaces, with black ocellus saddled on caudal peduncle above ---------- sordidus.

g^2. Several rows of small scales on infraorbitals; 7 dark vertical bands, wide as interspaces; dark caudal blotch only present in young. septemfasciatus.

f^1. Blackish spot at suprascapular and at pectoral origin; 5 whitish vertical lines, only median usually persistent with age---------- notatus.

b^2. AMBLYGLYPHIDODON. Orbicular; 1 or 2 rows of scales above end of upper section of lateral line; transverse dark bands usually ill defined or absent.

h^1. Body with 6 broad, dark, transverse bands; preorbital and infraorbitals with row of scales---------- curacao.

h^2. No dark transverse bands.

i^1. Preorbital and infraorbitals naked; largely golden-yellow; no dark spot at pectoral origin ---------- aureus.

i^2. Preorbital and infraorbital with row of scales; small black spot at pectoral origin; front of soft dorsal and anal and upper and lower caudal edges dusky---------- unimaculatus.

a^2. Ovate, ovate-oblong, or oblong; transverse bands, when dark never more than 1, when more numerous as narrow white bands; teeth uniserial or irregularly biserial.

j^1. STEGASTES. Oblong; 2 or 3 rows of scales above end of lateral line; anal base not longer than soft dorsal base.

k^1. Black transverse band between soft dorsal and anal; no white or blue spots on scales---------- dickii.

k^2. No black transverse band; scales with white or blue spots.

l^1. White transverse band from front of spinous dorsal down till behind pectoral base; black ocellus at juncture of spinous and soft dorsals; pectoral base pale---------- leucozonus.

l^2. No white transverse band or black ocellus present.

m^1. Pale spots mostly numerous along lower surface of body; pectoral base and ventral pale---------- azurepunctatus.

m^2. Pale spots scattered only over back and dark upper sides; pectoral base dusky; ventral blackish---------- lacrymatus.

j^2. CHRYSIPTERA. Oval to ovate oblong; 1 or 2 rows of scales above end of lateral line; teeth never lobulate or emarginate at tips.

n^1. Body ovate.

o^1. Back without oblique blue bands.

p^1. Black ocellus at last dorsal spines; each scale with light blue spot---------- bonang.

p^2. No black ocellus.

q^1. Body variegated, not uniformly dark.

r^1. Dusky band below eye and another along and behind preopercle edge; ventrals and front of anal dusky. xanthurus.

r^2. Three transverse dark bands, with white interspaces, on front half of body---------- thoracotaeniatus.

r^3. Back and head above yellowish, below darker; ventrals and front half of anal blackish---------- xanthonotus.

q^2. Uniform brown; black spot at pectoral origin------ behnii.

q^3. Uniform black ---------- melas.

o^2. Back with 3 oblique blue bands, coloration otherwise dark. oxyodon.

n^2. Body oblong.
s^1. Infraorbitals scaleless.
t^1. Body without transverse bands.
u^1. Dorsal spines graduated up to last, which longest.
v^1. Gray, brown, or blue, spotted with white or sky-blue.
w^1. Caudal forked; dark spot at pectoral origin; pale submarginal band on anal ..... bleekeri.
w^2. Caudal emarginate; sky-blue band from above eye to dorsal fin; black spot at pectoral base ..... biocellatus.
w^3. Caudal truncate; no dark spot at pectoral origin; anal without pale band ..... cyaneus.
v^2. Body yellowish-brown, without blue spots.
x^1. No black blotch at bases of last dorsal rays. glaucus.
x^2. Black blotch at bases of last dorsal rays. leucogaster.
u^2. Front and hind dorsal spines equal.
y^1. Black blotch at bases of last dorsal rays; size moderate ..... uniocellatus.
y^2. No black blotch at last dorsal rays; each scale with 2 dark vertical bars; blackish horizontal bands on muzzle and cheek; size small. sapphirus.
t^2. Body with transverse bands, ground-color dark.
z^1. Three white transverse bands; no white spots. amabilis.
z^2. Four transverse white bands; white spots present. albofasciatus.
z^3. Single white transverse band; white spots present ..... zonatus.
s^2. Infraorbital scaled.
a^4. Caudal and last dorsal rays pale; anal dusky ..... azysron.
a^5. Caudal and anal yellow.
b^3. Dark scapular blotch and smaller blotch at pectoral origin, axil pale. bankieri.
b^4. No dark scapular blotch and large blotch at pectoral origin and into axil of fin ..... melanocarpus.
a^6. Caudal with submarginal dark band above and below ..... anabatoides.

ABUDEFDUF SAXATILIS (Linnaeus)

Chaetodon saxatilis Linnaeus, Syst. Nat., ed. 10, 1758, p. 276. India.—Osbeck, Reise Ost Ind. China, 1765, p. 356 (China).—Forskål, Descript. Animal., 1775, pp. xiii, 62 (Djedda).—Bloch, Naturg. Ausl. Fisch., vol. 3, 1787, p. 96, pl. 206, fig. 2 (East Indies, Arabia).

Glyphisodon saxatilis Rüppell, Atlas Reise Nördl. Afr., Fisch., 1828, p. 35 (Red Sea).—Martens, Verh. zool. bot. Ges. Wien, vol. 66, 1866, p. 378 (Scherm Abu-Nechle, Red Sea).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 608 (Misaki, Yagoshima, Enoshima, Shimoda, Formosa).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).

Glyphidodon saxatilis Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 524 (Red Sea).—Kossmann and Räuber, Zool. Ergebn. K. Acad. Wiss. Berlin, vol. 1, 1877, p. 24 (Red Sea).—Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 4 (St. Paul's Rocks, Indian Ocean).—Giglioli,

Ann. Mus. Civ. Stor. Nat. Genova, vol. 26, 1888, p. 71 (Assab).—Steindachner, Abhand. Senckenberg. Gesell., vol. 25, 1900, p. 441 (Ternate); Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 149 (Socotra).

Abudefduf saxatilis Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 28 (Manila).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Manila and Calayan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Misaki and Tanegashima).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 345 (Lombok, Sayu, Beo, Salomakie, New Guinea, Buton Straits, Saleyer, Binongka, Banda Sea, Ambon, Nusa Laut, Taam Island, Rotti, Kupang, Postillion Islands).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Abudefdul saxatilis saxatilis Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 127 (Sorong, New Guinea and Saonek).

Chaetodon rotundus Linnaeus, Syst. Nat., ed. 10, 1758, p. 277. Indies.

Glyphisodon vaigiensis Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 391. Isles des Papous.

Glyphisodon waigiensis Castelnau, (Res. F. Austral.) Victoria Off. Rec. Phila. Ex., 1875, p. 35 (Cape York).

Glyphidodon coelestinus var *waigiensis* Ishikawa and Matsuura, Prelim Cat. Fish. Mus. Tokyo, 1897, p. 31 (Japan).

Glyphisodon rahti Cuvier, Hist. Nat. Poiss., 5, 1830, p. 456. New Guinea. Red Sea, Java, Celebes.—Valenciennes, Hist. Nat. Poiss., vol. 9, 1833, p. 507 (Bombay).—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 22 (Java, Celebes, Moluccas, Amboina, west New Guinea).—Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1845 (1846), p. 253 (China).

Glyphidodon rahti Cantor, Journ. As. Soc. Bengal (Cat. Malay. Fish.), vol. 18 (2), 1849, p. 1224 (Pinang, Malay Peninsula, Singapore).

Chaetodon tyrwhitti Bennett, Fishes of Ceylon, 1834, p. 41, pl. 25. Ceylon.

Glyphisodon tyrwhitti Richardson, Rep. Brit. Assoc. Adv. Sci., (Ich. Chin. Jap.), 1845 (1846), p. 253 (Canton).

Glyphisodon quadrifasciatus Bleeker, Verh. Bat. Genoot. (Labr.), vol. 21, 1846–47, p. 17. Java.

Sparus fasciatus (not Bloch) Gray, Cat. Fish. Gronow, 1854, p. 60 Indian Sea.

Glyphisodon biniar (Montrouzier) Thiollière, Faun. Woodlark, 1857, p 199. Woodlark Island.

Apogon quinquevittatus Blyth, Journ. As. Soc. Bengal, 1859, p. 272.

Glyphidodon coelestinus (part) Günther, Cat. Fish. Brit. Mus., vol. 4 1862, p. 38 (Pinang, China, Amboyona, India); Fishes of Zanzibar, 1866, p. 82 (Aden, Zanzibar, Seychelles).—Bleeker, Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 101, pl. 408(9), fig. 5.—Day, Fishes of India, pt. 3, 1877, p. 386, pl. 83, fig. 2 (Bombay); Fauna British India, vol. 2, 1889, p. 389, fig. 129.

Abudefduf septemfasciatus (not Cuvier) Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bulan).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).

Abudefduf bengalensis (not Bloch) Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Tanegashima).

Depth 1⅘ to 2; head 3 to 3⅓, width 1¾ to 1⅘. Snout 3¼ to 3¾; eye 3 to 3⅓, greater than snout, 1 to 1⅛ in interorbital; maxillary extends little behind nostril, to eye in young, 2⅘ to 3½ in head; teeth uniserial, compressed incisors, anterior slightly notched; inter-

orbital 2¾ to 3, convex; preopercle edge entire. Gill rakers 10+18, rather long, slender.

Tubes in lateral line 20 to 21; pores in straight section 9 or 10+0 to 2; 4 or 5 scales above lateral line, 11 or 12 below, 25 to 27 predorsal forward nearly to snout end; preorbital and infraorbitals with row of scales, and 3 or 4 rows on cheek. Scales with 8 or 9 basal radiating striae; apical denticles 96 to 145, with 5 or 6 transverse series of basal elements; circuli very fine.

D. XIII, 12, 1 or 13, 1, thirteenth spine 1¾ to 2⅛ in head, fourth ray 1 to 1⅕; A. II, 12, 1 or 13, 1, second spine 1⅔ to 2, fifth ray 1⅛ to 1⅓; caudal 2½ to 2⅘ in combined head and body, well forked; least depth of caudal peduncle 2 in head; pectoral 2⅔ to 3⅛ in combined head and body; ventral 3 to 3¼.

Dark slaty gray, slightly tinged with olivaceous on upper surface of body, becomes pale or light gray below. Each scale with little darker edge, though little paler below. Upper profile of head and predorsal dusky or blackish. Side with 6 broad blackish vertical bands, becoming indistinct below; first on back at first dorsal spine; second from anterior dorsal spines; third from hind dorsal spines; fourth on soft dorsal medianly and extends down to lower side of caudal peduncle; last with fifth rather broad dusky or blackish vertical bar little posterior. Fins dusky or grayish, caudal mostly uniform. Soft dorsal and anal with dusky terminally, on first forming cross band from upper portion of front rays to upper portion of last. Soft anal similarly marked, though bar broader.

Red Sea, Zanzibar, India, Malacca, East Indies, China, Formosa, Japan, Melanesia, Micronesia, Polynesia.

11116 to 11121 Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. 8 examples. Length, 160 to 175 mm.

D. 5332. 2 examples, Apo Light, Sablayan Bay, from drift wood. December 12, 1908. Length, 40 to 50 mm.

7 examples, Batan Island. July 22, 1909. Length, 17 to 24 mm.

1 example, Buang Bay, Talajit Island. March 15, 1909. Length, 155 mm.

3 examples, Bubuan Island, Jolo. February 14, 1908. Length, 102 to 105 mm.

5 examples, Busin Harbor. Length, 13 to 15 mm.

1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 139 mm.

6 examples, Canimo Island, near Daet. June 15, 1909. Length, 20 to 32 mm.

3 examples, Grande Island Reef. January 8, 1908. Length, 90 to 140 mm. 4634 B. F.

10418. East side of Verde Island. July 22, 1908. Length, 130 mm.

21830. Cebu market. March 22, 1909. Length 170 mm.

9916. Inamucan Bay, Mindanao. August 8, 1909. 2 examples. Length, 146 to 157 mm.

9 examples, Jolo. Drifting log at ship's side. March 6, 1908. Length, 18 to 29 mm.

2 examples, Jolo. March 6–7, 1908. Length, 24 to 84 mm.

12966. Langao Point, Luzon. June 24, 1909. Length, 121 mm.

11907. Lampinagan Island. September 11, 1909. Length, 175 mm.

2 examples, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 19 to 125 mm.

5 examples, Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 106 to 143 mm.

1 example, Little Santa Cruz Island. May 28, 1908. Length, 100 mm.

14664. Lode Bay, Destacado Island. March 13, 1909. Length, 123 mm.

1 example, Mahinog, Camiguin Island. August 2, 1909. From torch fisherman. Length, 36 mm.

1 example, Mahinog. August 3, 1909. Length, 41 mm.

13541. Makyan Island. November 29, 1909. Length, 150 mm.

1 example, Murcielagos Bay. August 9, 1909. Length, 114 mm.

8736. Northwest of Verde Island. July 22, 1908. 2 examples. Length, 168 to 170 mm.

1 example, N. Lat. 10° 28′, W. Long. 120° ? 29′, on floating sea-weed. May 7, 1908. Length, 20 mm.

1 example, Opol, Mindanao. August 4, 1909. Length, 145 mm.

1 example, Pagapas Bay, Luzon. February 20, 1909. Length, 112 mm.

1 example, Pangasinan Island. February 13, 1908. Length, 92 mm.

1 example, Papagan Island. October 23, 1909. Length, 24 mm.

4 examples, Philippines. Length, 102 to 128 mm.

3 examples, Philippines. Length, 20 to 25 mm. [2174.]

12054, 20674, 22629, and 22632. Port Banalacan, Marinduque. Length, 140 to 168 mm.

8 examples, Port Dupon. March 7, 1909. Length, 11 to 16 mm.

10487. Port Maricaban. July 21, 1908. 3 examples. Length, 100 to 128 mm.

3 examples, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 108 to 187 mm.

12132 and 12136 [941.] Port Uson, Busuanga Island. December 19, 1908. Length 145 to 162 mm. Silvery, greenish-blue above, bars blackish, margins of scales black, centers somewhat indigo; dorsal darker toward tip; bright lemon area between black bars in first and second interspaces; small dashes of same color at base of anal.

20779 and 20780. Powati Harbor. November 28, 1909. Length, 170 to 173 mm.

1 example, Romblon Harbor. March 25, 1908. Length, 114 mm.

2 examples, San Miguel Harbor, Ticao. April 21, 1908. Length, 17 or 18 mm.

11919. Siasi Island market. February 17, 1908. Length, 182 mm.

12893. Silino Island. August 10, 1909. 7 examples. Length, 28 to 156 mm.

3 examples, Taganak Island. January 7, 1909. Length, 115 to 150 mm.

3 examples, Tara Island. December 15, 1909. Length, 25 to 27 mm.

D. 5561. 3 examples, Teomabal Island. December 15, 1909. Length, 25 to 27 mm.

3 examples, Usada Island, near Jolo. March 5, 1908. Length, 177 to 187 mm. [7159, 7160, 7161.]

52220 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 160 mm.

56147 U.S.N.M. Bulan, Philippines. Length 125 mm. As *Abudefduf septemfasciatus.*

56323 U.S.N.M. Manila. G. A. Lung. Length, 114 mm.

57980 U.S.N.M. Zamboanga. Length 156 to 160 mm. 3 examples. As *Abudefduf septemfasciatus.*

56402 U.S.N.M. Mangareva. *Albatross* collection. 5 examples. Length, 33 to 43 mm.

65710 U.S.N.M. Fakarava, Paumotus. *Albatross* collection. 7 examples. Length, 11 or 12 mm.

71226 U.S.N.M. Misaki, Japan. *Albatross* collection. 6 examples. Length, 26 to 60 mm.

71449 U.S.N.M. Tanegashima, Japan. *Albatross* collection. 50 examples. Length, 18 to 50 mm.

72161 U.S.N.M. Manila market. R. C. McGregor. Length, 59 mm.

27699 and 27700 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 116 to 142 mm.

27701 A.N.S.P. Batu Sangkar, Sumatra. Messrs. Harrison and Hiller. Length, 85 mm.

ABUDEFDUF BENGALENSIS (Bloch)

Chaetodon bengalensis Bloch, Naturg. Ausl. Fisch., vol. 3, 1787, p. 110, pl. 213, fig. 2. Bengal.—Forster, Faun. Indica, 1795, p. 15.

Glyphisodon bengalensis Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 458 (Vanicolo, Red Sea, Masseuah, East Indies, Coromandel).—Schlegel and Müller, Nat. Gesell. Nederl. Zool., vol. 2, 1839–1844, p. 22 (Java and Celebes).

Glyphidodon bengalensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 41 (Amboyna).—Kner, Reise Novara, Fisch., vol. 1, 1865, p. 244 (Java, Singapore, Hong Kong).—Capello, Jorn. Sci. Math. Lisboa, 1871, p. 282 (Mozambique).—Day, Fishes of India, pt. 3, 1877, p. 387 (not pl. 83, fig. 3) (Andaman Islands).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 4.—Day, Fauna British India, vol. 2, 1889, p. 389.

Glyphidodon (*Glyphidodon*) *bengalensis* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 99 (Singapore, Bintang, Banka, Java, Sumbawa, Celebes, Sangi, Amboina, New Guinea).

?Chaetodon abudafur hanni Forskål, Descript. Animal., 1775, p. xiii, p. 65. Arabia.

Labrus macrogaster (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 430, 470, pl. 19, fig. 3. The Great Ocean.

Glyphidodon affinis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 41. China.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 5486. (Luzon, Cavite, Santa Cruz).

Glyphidodon saxatilis (part) Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 524 (Red Sea).

Glyphidodon caelestinus (not Valenciennes) Day, Fishes of India, pt. 3, 1877, pl. 83, fig. 2.

Depth 1⅗ to 1⅞; head 3⅛ to 3⅖, width 1⅔. Snout 2⅘ to 4⅖; eye 3½ to 3⅞, greater than snout or interorbital, to 1⅕ in snout, to 1¼ in interorbital; maxillary reaches to nostril or nearly reaches eye, 3$\frac{1}{10}$ to 3¾ in head; teeth uniserial, compressed, truncate, ends notched; interorbital 2⅞ to 3, convex. Gill rakers 7+15, lanceolate.

Tubes in lateral line 21 to 23; pores in straight section 8 or 9+0 or 1; 4 to 6 scales above lateral line, 11 to 13 below, 16 to 18 predorsal scales forward opposite front eye edge; preorbital, infraorbitals and narrow preopercle flange naked; 3 rows of scales on cheek. Scales with 8 or 9 basal radiating striae; apical denticles 126 to 140, with 5 transverse series of basal elements; circuli very fine.

D. XIII, 12 to 15, fifth spine 1⅘ to 2⅓ in head, fifth ray 2⅞ to 3⅗ in combined head and body; A. II, 11 to 15, second spine 2 to 2⅕

in head, sixth ray 1 to 1⅕; caudal deeply emarginate, 2⅔ to 2¾ in combined head and body; least depth of caudal peduncle 1⅘ to 1⅞ in head; pectoral 2⅞ to 3½ in combined head and body; ventral 2½ to 4.

Dull greenish-olive, but little paler below. Back and upper surface with 7 vertical dusky olive bands, scarcely over 2 scales wide and the pale interspaces 3 or 4 scales wide; first band from nape down towards postocular region; second at front of spinous dorsal to pectoral axil; third, fourth, and fifth bands from base of spinous dorsal; sixth band from bases of last dorsal rays on front of caudal peduncle to bases of last anal rays; seventh band often indistinct at caudal base, narrow. Vertical fins all more or less dusky terminally. Ventral dusky in front, paler behind. Pectoral with small deep dusky spot, less than pupil, at origin of fin.

Red Sea, Mozambique, India, East Indies, China. This species greatly resembles *Abudefduf saxatilis* and *Abudefduf septemfasciatus*, though closer to the latter. It differs from the latter chiefly in the narrower dark vertical bands and their slightly different disposition. Our examples usually show a dark basal caudal blotch, possibly due to preservation?

Chaetodon abudafur hanni Forskål is apparently the earliest name applied. It is, however, somewhat doubtful and not clearly diagnosed. The imperfect items are as follows:

Rostrum obtusum; dentes rigidi; molares obtusi plurium serierum; fasciae 5; alternae latiores; radii D. 3, 4, 5, inermes, longiores.

13802 to 13804. Catbalogan, Samar. April 15, 1908. 9 examples. Length, 135 to 159 mm.
2 examples, Endeavor Strait. December 23, 1908. Length, 105 to 123 mm.
11474 and 11475. Kayoa market. October 20, 1908. Length, 130 to 133 mm.
12136. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 150 mm.
2 examples, Nabatas Point, Samar. July 24, 1909. Length, 140 to 143 mm.
19475. Pangauran River, Port Caltom. December 16, 1908. Length, 141 mm.
14954. Port Ciego, Balabac. January 3, 1909. Length, 138 mm.
4 examples, Sablayan, Mindoro. December 13, 1908. Length, 65 to 105 mm.
20942. San Miguel Harbor, Ticao Island. April 21, 1908. 2 examples. Length, 42 to 62 mm.
1 example San Roque, Leyte. July 29, 1909. Length 120 mm.
1 example, Zamboanga Harbor, Ticao Island. April 21, 1908. Length, 40 mm.
57958 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 43 mm.

ABUDEFDUF SEXFASCIATUS (Lacépède)

Labrus sexfasciatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 430, 477, pl. 19, fig. 2. The Great Ocean [Indo-Pacific].

Abudefduf sexfasciatus Jordan and Snyder, Proc. U. S. Nat Mus., vol. 23, 1901, p. 755 (Shimoda and Misaki).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Tanegashima).

Glyphisodon coelestinus (Solander) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 464, pl. 348. Sea of the Indies, Mauritius, Malabar, Ulietea, Society Islands.—Valenciennes, Hist. Nat. Poiss., vol. 9, 1833, p. 508 (Seychelles).—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 22 (Batavia, Manado, Celebes).—Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1845 (1846), p. 253 (China).—Guichenot, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, 1866, p. 145 (Madagascar).—Whitley, Australian Zoologist, vol. 4, pt. 4, April, 1926, p. 230 (Murray Island, Two Isles, Port Denison, Masthead Island; Lord Howe Island; New Hebrides; Philippines; Amboina; Samoa; Friendly Islands).

Glyphidodon coelestinus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 38 (Hong Kong).—Kner, Reise Novara, Fisch., pt. 2, 1865, p. 244 (Java).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 271 (south coast of Luzon); Idem., 1876, p. 442 (Mauritius and Seychelles).—Martens, Preuss. Exp. Ost Asien, 1876, p. 396 (Amboina R.).—Günther, Philos. Tr. Roy. Soc., vol. 188, 1879, p. 470 (Rodriguez).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 193 (Singapore).—Meyer, An. Soc. Hist. Nat. Espanola, vol. 14, 1885, p. 34 (Celebes, Sangi, Ternate).—Boulenger, Proc. Zool. Soc., London, 1887, p. 664 (Muscat).—Weber, Reis. Ned. Ost Indien, vol. 3, 1894, p. 416 (Celebes).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 545 (Luzon, Batangas, Nasugbu, C. de Cebu).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 31 (Japan).—Jatzow and Lenz, Fisch. Ost Afr. Mad. Aldabra, 1898, p. 518 (Zanzibar).—Borsieri, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 1, 1904, p. 213 (Massaua, Red Sea).—Regan, Journ, Bombay Nat. Hist. Soc., vol. 16, pt. 2, 1906, p. 330 (Persian Gulf); Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Seychelles, Praslin).—Gilchrist and Thompson, Ann. S. Afr. Mus., vol. 6, 1908–1911, p. 196 (Natal).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, 1914–1917, p. 375.—Regan, Ann. Durban Mus., vol. 1, 1914–1917, p. 459 (Durban).

Glyphidodon (*Glyphidodon*) *coelestinus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 101 (Sumatra, Batu, Nias, Pinang, Singapore, Java, Banka, Duizend Islands, Bawean, Bali, Celebes, Sangi, Flores Timor, Letti, Halmahera, Ternate, Batjan, Buru, Amboina, Ceram, Goram, New Guinea, Philippines).

Glyphisodon sordidus Rüppell, Atlas Reis. Nördl. Afr., Fisch., 1828, p. 34, p. 464 (name in text).

Abudefduf coelestinus coelestinus Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 128 (Saonek).

Abudefduf coelestinus Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 505 (Okinawa).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 48 (Cebu).

Depth 1⅞ to 2; head 3 to 3¼, width 1⅞ to 2. Snout 3⅞ to 4; eye 2⅖ to 3⅛, greater than snout, 1 to 1⅛ in interorbital; maxillary reaches to or little beyond front eye edge, 3⅛ to 3⅓ in head; teeth uniserial, compressed, median in each jaw slightly bifid or with median marginal notch; interorbital 2⅗ to 3⅙, broadly convex. Gill rakers 9+17, lanceolate, 1⅓ in gill filaments.

Tubes in lateral line 19 to 21, followed by 1 to 3 irregular pores; pores in straight section 7 or 8 to caudal base and sometimes 1 or 2

more on latter; 5 scales above lateral line, 10 or 11 below, 26 or 27 predorsal forward nearly to snout end; preorbital free and infraorbitals adnate, with row of scales; cheek below infraorbitals with 3 or 4 rows of scales. Scales with 9 or 10 basal radiating striae; apical denticles 88 to 99, basal elements in 4 to 8 transverse series; circuli very fine.

D. XIII, 12, 1 or 13, 1, fourth spine 1¾ to 1⅘ in head, fourth ray 1⅓ to 1⅖; A. II, 12, 1, second spine 1⅘ to 1⅚, fourth ray 1⅕ to 1¼; caudal 2⅕ to 2½ in combined head and body, deeply forked and upper lobe usually longer; least depth of caudal peduncle 2 to 2⅙ in head; pectoral 2¾ to 3⅛ in combined head and body; ventral 2⅔ to 3⅛.

Grayish above, often with pale bluish tinge, to whitish below. Five blackish vertical bands, not quite to lower body edge, and extending above on dorsals; first band at predorsal to pectoral axil; second and third from spinous dorsal; fourth from greater median portion of soft dorsal; fifth on caudal peduncle posteriorly. Dorsal fins pale dusky, spines terminally with violet tints. Soft anal rather deep dusky to blackish terminally. Each caudal lobe with longitudinal blackish band. Pectoral base dusky, fin pale brown. Ventral dusky anteriorly, paler behind, lower face with light bluish tint. Iris pale yellowish, with neutral tinge or blotch above and sometimes below anteriorly.

Red Sea, Zanzibar, Natal, Mauritius, Persian Gulf, East Indies, Philippines, China, Riu Kiu, Japan, Melanesia, Polynesia. Easily distinguished among related species as *Abudefduf saxatilis*, *Abudefduf septemfasciatus*, etc., by the presence of the dark longitudinal band in each caudal lobe. Young with large black blotch at caudal base.

11949. Alimango Bay, Burias Island. March 5, 1909. Length, 144 mm.
3 examples, Bolalo Bay, Palawan. December 21, 1908. Length, 137 to 143 mm.
13790, 13793 to 13796. Batan Reef. October 25, 1908. Length, 42 to 143 mm.
1 example, Butauanan Island. June 13, 1909. Length, 121 mm.
1 example, Biri Channel. June 1, 1909. Length, 142 mm.
15026 and 15027. Busin Harbor, Burias Island. March 7, 1909. Length, 133 to 142 mm.
1 example, Candaraman Island, Balabac. January 4, 1909. Length, 120 mm.
12742. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 105 mm.
1 example, Casogoran, Malhon Island. July 27, 1909. Length, 142 mm.
5910 B. F. Catbalogan, Samar. April 15, 1908. Length, 115 mm.
2 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 128 to 137 mm.
10775. Dalaganem Island. April 8, 1909. Length, 163 mm.
89. Endeavor Strait. December 23, 1908. 5 examples. Length, 93 to 110 mm.
4 examples, Limbones Cove. January 14, 1908. Length, 132 to 148 mm.
20914, 20915, 20918. Little Santa Cruz Island, Zamboanga. March 26, 1908. Length, 148 to 161 mm.

14997. Makesi Island, Palawan. April 5, 1909. Length, 110 mm.
11344. Mompog Island. March 3, 1909. Length, 152 mm.
1 example, Masamat Bay, Quinalasag Island. June 12, 1909. Length, 115 mm.
13893 and 13894. Observatory Inlet. December 19, 1908. 5 examples. Length, 31 to 58 mm.
4 examples, Opol, Mindanao Island. August 4, 1909. Length, 140 to 153 mm.
1 example, Porongpong Island, Palumbanes Group. June 11, 1902. Length, 138 mm.
2 examples, Port Caltom. December 15, 1908. Length, 31 to 50 mm.
3 examples, Philippines. Length, 102 to 118 mm.
15118. Port Dupon, Leyte Island. March 17, 1909. Length, 155 mm.
55. Port Langcan, Palawan Island. April 8, 1909. Length, 92 mm.
2 examples, Quinalasag Island, Masamat Bay. June 12, 1909. Length, 130 to 131 mm.
7 examples, Romblon. March 26, 1908. Length, 33 to 50 mm.
3 examples, Sablayan, Mindoro. December 12, 1908. Length, 100 to 130 mm.
14016. Santo Domingo, Batan Island. November 16, 1908. Length, 162 mm. Variant, with only upper caudal lobe with median dark band and lower lobe uniformly pale.
11889 [598]. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 146 mm. Alternately barred with light viridian and slate-indigo; lighter spaces irregularly dusky and bluish; lower sides much blotched with white; spines of dorsal ultramarine distally, remainder of fin similar to adjacent body; caudal dusky-slate, with broad black stripe at the center of each lobe; fine scales at base bright ultramarine; anal body-color, paired fins paler; pectoral membranes hyaline; ventrals with a dusting of green.
2 examples, San Miguel Harbor. April 21, 1908.
14003 to 14006. West coast Palaui Island. November 18, 1908. Length, 144 to 152 mm.
14742. Limbe Strait, Celebes. November 10, 1909. Length, 167 mm.
52405 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 22 to 150 mm. 11 examples.
57587 U.S.N.M. Japan. J. Morrow. Length, 80 to 95 mm. 2 examples.
65714 U.S.N.M. Papeete, Tahiti. *Albatross* collection. Length, 182 mm.
65715 U.S.N.M. Fakarava, Paumotus. *Albatross* collection. Length, 15 to 42 mm. 10 examples.
70745 U.S.N.M. Tanegashima. *Albatross* collection. Length, 40 mm.
71565 U.S.N.M. Okinawa. *Albatross* collection. Length, 138 to 158 mm. 3 examples.
84199 U.S.N.M. Cebu. Dr. F Baker. Length, 142 mm.
31139 to 31141 A.N.S.P. Apia, Samoa. Bureau of Fisheries. Length, 73 to 105 mm.
51113 A.N.S.P. Pago Pago, Samoa. Capt. C. F. Silvester. Length, 18 mm.
48733 A.N.S.P. Philippines. Philadelphia Commercial Museum. Length, 55 mm.

ABUDEFDUF SORDIDUS (Forskål)

Chaetodon sordidus Forskål, Descript. Animal., 1775, pp. 13, 62. Djedda, Red Sea.—Gmelin, Syst. Nat. Linn., 1789, p. 1067 (Arabia).—Schneider, Syst. Ich. Bloch, 1801, p. 230 (Arabia).

Pomacanthus sordidus Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 517, 519 (Arabia).

Glyphisodon sordidus Rüppell, Atlas Reis. Nördl. Afr., Fisch., 1828, p. 34, pl. 8, fig. 1 (Mohila, Red Sea).—Cuvier, Hist. Nat. Poiss., vol. 5, 1834, p. 466 (Macuer Island, Red Sea).—Richardson, Proc. Brit. Assoc. Adv. Sci. (Ich. China Jap.) 1845 (1846), p. 253 (China).—McCulloch and Waite, Trans. Roy. Soc. S. Australia, vol. 40, 1916, p. 444, pl. 40, fig. 1 (Lord Howe Island, Norfolk Island, Funafuti in Ellice Group, New Hebrides, type of *Glyphidodon leucopleura* Day).

Glyphidodon sordidus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 41 (China, Mauritius, Red Sea).—Kner, Reise Novara, Fisch., pt. 2, 1865, p. 243 (Nicobars).—Günther, Fishes of Zanzibar, 1866, p. 83 (Aden and Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 52 (Koseir, Red Sea).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 442 (Mauritius, Seychelles).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 5.—Day, Fishes of India, pt. 3, 1877, p. 385, pl. 83, fig. 1 (Sind).—Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 51 (Raine Island); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 231 (Red Sea, East Africa, East Indies, Tahiti, Raiatea, Samoa, Bonin Islands).—Boulenger, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).—Day, Fauna British India, vol. 2, 1889, p. 386.—Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 430.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 546 (Luzon, Manila, Navotas).—Waite, Mem. Austral. Mus., vol. 3, pt. 3, 1897, p. 192 (Funafuti).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 31 (Japan).—Jatzow and Lenz, Fisch. Ost. Afr. Mad. Aldabra, 1898, p. 518 (West Madagascar and Majunga).—Steindachner, Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 149 (Gischin, South Arabia).—Gilchrist and Thompson, Ann. S. Afr. Mus., vol. 6, 1908–11, p. 196 (Natal).—Regan, Ann. Durban Mus., vol. 1, 1914–17, p. 169 (Durban).

Glyphidodon (*Glyphidodon*) *sordidus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 95 (Sumatra, Java, Cocos, Obi major, Amboina).

Abudefduf sordidus Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 418 (Misaki, Tanegashima), p. 504 (Okinawa).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 347 (Salibabu).

Glyphisodon geant Liénard, Dix Rap. Hist. Nat. Maurice, 1839, p. 35. Mauritius.

Glyphidodon leucopleura Day, Fishes of India, pt. 3, 1877, p. 385, pl. 83, fig. 4. Andamans; Fauna British India, vol. 2, 1889, p. 387.

Glyphisodon brownriggii (not Bennett) Waite, Prelim. Rep. Thetis. Ex., 1898, p. 61 (Lord Howe Island).

Depth 1⅗ to 1⅞; head 2⅗ to 2⅘, width 1¾ to 1⅞. Snout 3 to 3¼; eye 2⅞ to 3⅛, equals snout or little greater in young, 1 to 1⅛ in interorbital; maxillary reaches eye, or slightly beyond in young, 3⅓ to 3½ in head; teeth uniserial, compressed incisors, ends of each notched; interorbital 2⅘ to 3, broad and slightly convex; preorbital, infraorbital, and preopercle edges entire. Gill rakers 7+11, lanceolate, moderate.

Tubes in lateral line 21 to 23, often followed by 1 or 2 irregular pores; pores in straight section 7 or 8 to caudal base and 1 or 2 on

latter, not developed in young; 5 scales above lateral line to spinous dorsal origin, 14 below, 14 to 17 predorsal forward little before eyes though not to nostril; preorbital, infraorbitals, and preopercle flange naked; 3 rows of scales on cheek. Scales with 10 or 11 basal radiating striae, edge scalloped; apical denticles 55 to 138, with 3 or 4 transverse series of basal elements; circuli very fine.

D. XIII, 14, 1 or 15, 1, fourth spine 1⅞ to 2 in head, seventh ray 1½ to 1⅞; A. II, 15, 1 or 16, 1, second spine 1⅘ to 2, fourth ray 1¼ to 1⅓; caudal 2⅖ to 2⅞ in combined head and body, emarginate behind; least depth of caudal peduncle 1⅞ to 2 in head; pectoral 1 to 1⅛; ventral 2¾ to 3⅓ in combined head and body.

Olivaceous or olivaceous brown above, whitish below or soiled appearance usual. Iris pale yellowish to brownish. Seven paler vertical streaks, whitish in young, not more than 1 or 2 scales wide and much narrower than darker intervening bands; first streak at predorsal obsolete or often not evident; second from front of spinous dorsal to close behind pectoral axil; third, fourth, and fifth from below spinous dorsal; sixth from black saddle anteriorly, which always present on upper front of caudal peduncle; seventh at caudal base. Vertical fins often olivaceous or deep brown, pale vertical streaks of body extending on dorsals basally. Pectoral spot basally at origin nearly large as pupil, fin otherwise pale brown. Ventral dusky brown, hind rays little paler or grayish.

Red Sea, Zanzibar, Mauritius, India, East Indies, China, Philippines, Japan, Micronesia, Polynesia, Hawaii. Though Bleeker says it is not rare in the East Indies we have it from but few stations in the Philippines.

11906. Lampinigan Island. September 11, 1909. Length, 186 mm.
1 example, Nabatas Point, Samar. July 24, 1909. Length, 53 mm.
14948, 14956, 14959, 14960. Port Ciego, Balabac. January 3, 1909. Length, 45 to 157 mm.
1 example, Rapu Rapu Island. June 22, 1909. Length, 28 mm. [1685.]
12193. San Roque, Leyte. July 29, 1909. Length, 170 mm.
5 examples, Silino Island. August 10, 1909. Length, 23 to 40 mm.
1 example, Nan Wan, Formosa. January 27, 1910. Length, 18 mm.
19232 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 170 to 172 mm. 2 examples.
52448 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 41 to 167 mm. 4 examples.
55032 U.S.N.M. Honolulu. *Albatross* Collection. Length, 210 mm. 1 example.
55375 U.S.N.M. Laysan. *Albatross* Collection. Length, 92 to 124 mm. 4 examples.
65402 U. S. N. M. Mangareva. *Albatross* Collection. 20 examples. Length, 20 to 93 mm.
U.S.N.M. Rikatea. 4 examples. Length, 138 to 183 mm.
65716 U.S.N.M. Fakarava, Paumotu. Length, 147 mm. 1 example.

65717 U.S.N.M. Makatea. *Albatross* Collection. Length, 97 mm. 1 example.
70743 U.S.N.M. Tanegashima Island. *Albatross* Collection Length, 17 to 63 mm. 50 examples.
71052 U.S.N.M. Okinawa. *Albatross* Collection. Length, 18 to 50 mm. 11 examples.
71225 U.S.N.M. Misaki, Japan. *Albatross* Collection. Length, 24 to 56 mm. 13 examples.
71227 U.S.N.M. Tanegashima. *Albatross* Collection. Length, 61 mm. 1 example as *Abudefduf bengalensis.*
72714. U.S.N.M. Pelaboean Ratoe, Java. Messrs. Bryant and Palmer. Length. 23 mm. 1 example.
9606 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 116 mm.
9613 A.N.S.P. Oahu. Dr. W. H. Jones. Length, 96 mm.
28047 to 28051 A.N.S.P. Hawaiian Islands. Bureau of Fisheries. Length, 28 to 32 mm.
29629 A.N.S.P. Maui. R. C. McGregor.

ABUDEFDUF SEPTEMFASCIATUS (Cuvier)

Glyphisodon septemfasciatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 463. Mauritius.—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang. Sumatra).

Glyphidodon septemfasciatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 40 (China, Philippines, Ceylon).—Playfair, Proc. Zool. Soc. London, 1867, p. 864 (Seychelles).—Jouan, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 3, 1868, p. 258 (Hong Kong).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 442 (Seychelles).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 5.—Day, Fishes of India, pt. 3, 1877, p. 386, pl. 81, fig. 7 (Bombay).—Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 45 (Raine Island); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 230 (South Sea, Mauritius, Red Sea, East Africa).—Day, Fauna British India, vol. 2, 1889, p. 388.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 546 (Luzon, Batangas, Nusugbu).

Glyphidodon (*Glyphidodon*) *septemfasciatus* Bleeker, Nat. Verh. Holl. Maatsch, Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 97 (Sumatra, Nias, Java, Celebes, Sangi, Timor, Bouru, Amboina, Philippines).

Abudefduf septemfasciatus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 347 (Kangeang, Lombok, Salibabu).

Depth 1¾ to 2⅛; head 2⅘ to 3, width 1⅘ to 2. Snout 2½ to 3⅕; eye 3⅕ to 4, 1⅛ to 1½ in snout, 1 to 1¼ in interorbital; maxillary reaches opposite nostril, little beyond in young, 3⅛ to 3¼ in head; teeth compressed uniserial incisors, ends of each little notched; interorbital 2⅘ to 3, broadly convex; preorbital, infraorbital and preopercle edges free and entire. Gill rakers 7+16, lanceolate, slender, moderate.

Tubes in lateral line 20 or 21, pores in straight section 8 to 10 to caudal base and 0 to 2 on latter; 3 or 4 scales above lateral line, 11 or 12 below, 12 to 14 predorsal forward opposite front of eye; preorbital naked and infraorbitals with 1 or 2 series of small scales;

cheek below infraorbitals with 3 rows of scales, none on preopercle flange. Scales with 8 to 10 basal radiating striae; apical denticles 106 to 110, basal elements in 6 to 8 transverse series; circuli very fine.

D. XIII, 13, 1, fourth spine 1⅘ to 2¼ in head, fourth ray 1⅖ to 1½; A. II, 13, 1, second spine 1⅘ to 2⅓, fourth ray 1⅓ to 1⅞; caudal 2⅗ to 2¾ in combined head and body, well forked and upper lobe usually little longer; least depth of caudal peduncle 1⅞ to 2 in head; pectoral 1; ventral 2⅔ in combined head and body.

Back and upper surfaces dull oliveaceous, under surfaces whitish. Seven deep brown vertical bands, each about 3 scales wide and wide as interspaces; first on occipital region down to postocular; second directly before spinous dorsal origin down to pectoral axil; third, fourth and fifth from bases of spinous dorsal rays; sixth from base of soft dorsal; seventh on caudal peduncle, from above medianly and with blackish saddle in young. Fins all pale brownish. Small neutral dusky spot, much less than pupil, at pectoral origin. Iris yellowish-white.

Red Sea, East Africa, Mauritius, India, East Indies, China, Philippines, Melanesia, Micronesia, Polynesia. Distinguished by the presence of 7 vertical dark bars and the uniformly pale caudal fin.

13325. Amboina market. December 7, 1909. Length, 130 mm.
19231 U.S.N.M. Fanning Islands. Dr. T. H. Streets. 5 examples. Length, 165 to 173 mm.
52309 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 48 mm.
52429 U.S.N.M. Apia. Bureau of Fisheries. 4 examples. Length, 120 to 180 mm.
57958 U.S.N.M. Zamboanga. Major Mearns. Length, 43 mm.
65711 U.S.N.M. Makemo, Paumotus. *Albatross* collection. 9 examples.
65712 U.S.N.M. Tari Tari, Gilbert Islands. *Albatross* Collection. Length, 155 mm.
65713 U.S.N.M. Makatea, Paumotus. *Albatross* collection. 32 examples.
27698 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 103 mm.

ABUDEFDUF NOTATUS (Day)

Glyphidodon notatus Day, Proc. Zool. Soc. London, 1869, p. 521. Andaman Islands; Fishes of India, pt. 3, 1877, p. 386, pl. 83, fig 5 (Andamans); Fauna British India, vol. 2, 1889, p. 387.

Abudefduf clarki Snyder, Proc. U. S. Nat. Mus., vol. 40, 1912, p. 534. Tanegashima and Misaki.—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419, pl. 53, fig. 2 (Misaki).

Depth 1⅘ to 1⅞; head 2¼ to 3½, width 1⅞ to 2⅛. Snout 3¼ to 3⅘; eye 2⅔ to 3¼, equals snout, greater than snout in young, little over interorbital in adult, little greater than interorbital in

young; maxillary reaches to or slightly beyond front eye edge, 3 to 3⅘ in head; teeth uniserial, small, compressed, end of each little notched; interorbital 2¾ to 3, broadly convex. Gill rakers 8+18, lanceolate, slender, long.

Tubes in lateral line 19 to 21, pores in straight section 8+1; 4 scales above lateral line to spinous dorsal origin, 10 below, 17 predorsal; 3 rows of cheek scales, none on infraorbital. Scales with 8 to 10 basal radiating striae; apical denticles 21 to 89, with 1 to 10 transverse series of basal elements; circuli very fine.

D. XIII, 13, 1, fourth spine 2 to 2$\frac{1}{10}$ in head, fourth ray 1⅓ to 1⅗; A. II, 13, 1, second spine 1⅘ to 2⅛, fourth ray 1¼ to 1⅔; least depth of caudal peduncle 2 to 2⅛; pectoral 1 to 1⅛; ventral 1; caudal 2⅓ to 2½ in combined head and body, deeply forked.

Brown generally, each scale on body with more or less gray brown border. Body with 5 pale or whitish vertical lines, though only median distinct and conspicuous in adult example. Head with coppery brown and gray to scales, obsolete or largely confined to cheeks and opercles. Blackish blotch, little less than pupil at suprascupula and another at pectoral origin. Caudal dull yellowish. Fins all brownish. Caudal and pectoral paler or light yellowish. Young without dark scapular blotch.

Andamans, Philippines, Japan. It differs at once from *Abudefduf saxatilis*, *A. septemfasciatus* and *A. sexfasciatus*, in the color pattern.

The original description by Day unquestionably pertains to our materials, and agrees in every way as he so clearly describes. Likewise his figure. Though he does not mention the dark suprascapular spot or the dark border of the opercle posteriorly, his figure clearly shows these features. The species is certainly not to be confused with *Abudefduf sordidus*.

The type of *A. clarki* is a very poor example, evidently a greatly darkened formalin example. It agrees in all essential characters with our Philippine material upon comparison. The median vertical white line is now hardly evident in the type of *A. clarki*, likewise the post-median white line. The caudal has also become greatly darkened and the dark suprascapular blotch is inconspicuous. The species is far more contrasted than Snyder's figure shows.

23 examples, Silino Island, Philippines. August 10, 1909. Length, 22 to 90 mm.

68234 U.S.N.M. Tanegashima, Japan. Length, 70 mm. *Albatross* Collection. Type of *Abudefduf clarki*.

74534 U.S.N.M. Tanegashima. *Albatross* Collection. 1 example. Length, 50 mm.

74588′ U.S.N.M. Misaki, Sagami. *Albatross* Collection. 2 examples. Length, 26 to 43 mm.

ABUDEFDUF CURACAO (Bloch)

Chaetodon curacao Bloch, Naturg. Ausl. Fisch., vol. 3, 1787, p. (79) 106, pl. 212, fig. 1. "Southern America, Curacao Island."

Glyphisodon curassao Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 471 (no locality).

Abudefduf curacao Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 347 (Elat and Kupang).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 48 (Zamboanga).

Glyphidodon curacao Weber, Abhandl. Senckenberg. Gesell., vol. 34 (1) 1911, p. 7 (Kei Islands).

Glyphisodon trifasciatus Bleeker, Verh. Batav. Genoot. (Labr.), vol. 21, 1846–1847, p. 19. Java.

Glyphidodon trifasciatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 42 (Amboina and Ceram).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 3.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 231 (East Indies and Ponape).

Glyphidodon (*Amblyglyphidodon*) *trifasciatus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 165 (Batu, Nias, Java, Celebes, Floris, Ternate, Ceram, Amboina).

Glyphidodon nigrifrons Macleay, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 271. Southeast coast of New Guinea.

Glyphisodon nigrifrons McCulloch, Rec. Austral. Mus., vol. 11, No. 7, 1917, p. 182 (type).

Glyphisodon leucogaster (not Bleeker) Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).

Abudefduf leucogaster Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 48 (Zamboanga).

Chromis analis (not Cuvier) Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 292 (Apia, Samoa).

Abudefduf philippinus Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 54, fig. 21. Philippines.

Abudefduf saxatilis (part) Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 1⅗ to 1⅔; head 3 to 3¼, width 1¾ to 2. Snout 3½ to 3⅞; eye 2½ to 2⅞, 1 to 1$\frac{1}{10}$ in interorbital; maxillary reaches eye, 3 in head; interorbital 2⅗ to 3, broadly convex. Gill rakers 7+18, lanceolate, moderate.

Tubes in lateral line 14 to 17, pores in straight section 10+2; 3 scales above lateral line, 9 below, 19 to 23 predorsal; 4 rows of cheek scales, with uppermost as row of preorbital and infraorbitals. Scales with 7 to 9 basal radiating striae; apical denticles 68 to 143, with 2 to 4 transverse series of basal elements; circuli very fine.

D. XIII or XIV, 12, 1 or 13, 1, thirteenth spine 1½ to 1⅗ in head, second ray 3⅕ to 3¼ in combined head and body; A. II, 13, 1 or 14, 1, second spine 1$\frac{1}{10}$ to 1½ in head, first ray 1⅛ to 1⅕; least depth of caudal peduncle 1⅞ to 2; caudal forked, 2⅔ to 2¾ in combined head and body; pectoral 3 to 3¼; ventral 2¼ to 2⅘.

Back olive, below very pale brown to whitish underneath. Five vertical neutral dusky bands, 3 scales wide and narrowing below, also edge of each scale within dark bands narrowly pale. Iris olive gold. Spinous dorsal dusky neutral, other vertical fins all dull brown, with slightly darker tint marginally. Paired fins pale, hind ventral rays whitish.

East Indies and Oceania. Though wrongly credited to America originally, Bloch's type was doubtless from the East Indies. The species is quite uniform in color sometimes and then may be easily confused with related forms. Usually the dark vertical bands, each with a network due to the narrow pale edges of the scales included, are distinct. These are well shown in Bleeker's excellent figure.

1 example, Alibijaban Island, Ragay Gulf. March 6, 1909. Length, 98 mm.
22 examples, Alimango Bay, Burias Island. March 5, 1909. Length, 87 to 112 mm.
9 examples, Biri Channel. June 1, 1909. Length, 75 to 97 mm.
14920. Biri Channel. June 2, 1909. 5 examples. Length, 67 to 104 mm.
8 examples, Bolalo Bay, Palawan Island. December 21, 1908. Length, 72 to 105 mm.
4 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 97 to 117 mm.
3 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 70 to 75 mm.
2 examples, Bumbum Island. September 25, 1909. Length, 76 to 90 mm.
2 examples, Burias Island, Alimango Bay. March 5, 1909. Length, 95 to 105 mm.
4 examples, Busin Harbor, Burias Island. April 23, 1908. Length, 92 to 104 mm.
302 to 304 B. F. 5 examples, Busin Harbor, Burias Island. March 8, 1909. Length, 78 to 99 mm.
15 examples, Butauanan Island. June 13, 1909. Length, 46 to 112 mm.
2 examples, Cagayan. January 8, 1909. Length, 93 to 104 mm.
1 example, Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 108 mm.
1 example, Candaraman Island, Balabac. January 4, 1909. Length, 104 mm.
1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 104 mm.
3 examples, Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 90 to 110 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 90 mm.
1 example, Capunuypugan. May 10, 1908. Length, 88 mm.
3 examples, Caracaran, Batan Island. June 8, 1909. Length, 80 to 97 mm.
4 examples, Casogoran, Malhon Island. July 27, 1909. Length, 65 to 97 mm.
4 examples, Catbalogan, Samar. April 16, 1908. Length, 103 to 109 mm.
1 example, Caxisigan Island. January 2, 1909. Length, 102 mm.
2 examples, Daisy Island, west of Bumbum. January 6, 1910. Length, 70 to 88 mm.
10842, 10843, and 7424. Dalaganem Island. April 8, 1909. 7 examples. Length, 70 to 106 mm.
9. Danawan Island and Si Amil Island. September 26, 1909. Length, 90 mm.
1 example, Doworra Island. December 30, 1908. Length, 100 mm.
1 example, Endeavor Strait. December 22, 1908. Length, 98 mm.
76, 81, 91, 95, 96, 112, 115, 118. Endeavor Strait. December 23, 1908. 12 examples. Length, 57 to 108 mm.

1 example, Galera Bay, Mindoro. June 9, 1908. Length, 124 mm.
1 example, Guntao Island. December 20, 1908. Length, 87 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 103 mm.
3 examples, Jolo. March 6–7, 1908. Length, 85 to 104 mm.
13083. Kapoposang Island. December 28, 1909. 2 examples. Length, 100 to 108 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 104 mm.
17835, 17853. Langao Point, Luzon. June 24, 1909. Length, 93 to 95 mm.
12968. Langao Point, Luzon. June 24, 1909. Length, 88 mm.
3 examples, Libig, Lubang Island. July 14, 1908. Length, 87 to 110 mm.
2 examples, Ligpo Point, Balayan Bay. January 18, 1908. Length, 50 to 95 mm.
1 example, Limbones Cove. January 14, 1908. Length, 110 mm.
2 examples, Limbones Cove. February 8, 1909. Length, 95 to 103 mm.
2 examples, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 98 to 110 mm.
4 examples, Little Santa Cruz Bay. May 8, 1908. Length, 98 to 109 mm.
2 examples, Little Santa Cruz Island. May 28, 1908. Length, 108 to 110 mm.
5 examples, Mactan Cove, Mactan Island. April 6, 1908. Length, 72 to 108 mm.
3 examples, Mactan Island, Cebu. March 25, 1909. Length, 92 to 100 mm.
14564 and 14568. Maculabo Island. June 14, 1909. 3 examples. Length, 90 to 110 mm.
22045 and 22048. Maganas, Lagonoy Gulf, Luzon. June 17, 1909. Length, 103 to 110 mm.
14993 to 14996. Makesi Island, Palawan. April 5, 1909. Length, 74 to 93 mm.
12129 and 12137. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 104 to 118 mm.
12346, 14931, 14933. Mansalay, Mindoro. June 4, 1908. 10 examples. Length, 90 to 108 mm.
2 examples, Mantacao, west coast Bohol. April 8, 1908. Length, 67 to 96 mm.
1 example, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 90 mm.
7 examples, Maricaban Island, Luzon. January 20, 1908. Length, 90 to 105 mm.
14700. Matnog Bay. March 31, 1909. Length, 90 mm.
8 examples, Murcielagos Bay. August 9, 1909. Length, 83 to 105 mm.
8735. 2 examples, Northwest Verde Island. July 22, 1908. Length, 110 to 117 mm.
5 examples, Opol, Mindanao. August 4, 1909. Length, 93 to 115 mm.
4 examples, Oyster Inlet, Ulugan Bay. Length, 63 to 100 mm.
12850, 12851, 14288. Pagapas Bay, Luzon. February 20, 1909. Length, 95 to 118 mm.
13 and 16. Pandanon Island. March 23, 1909. 3 examples. Length, 85 to 103 mm.
19940. Parang, Mindanao. March 23, 1908. Length, 45 mm.
6 examples, Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 70 to 102 mm.
1 example, Panpan, Tara Island. September 20, 1909. Length, 73 mm.
13 examples, Philippines. Length, 70 to 107 mm.
13 examples, Polloc, Mindanao. May 22, 1908. Length, 58 to 108 mm.
13854. Port Banalacan, Marinduque. February 23, 1909. Length, 105 mm.
1 example, Port Caltom. December 15, 1908. Length, 110 mm.

15120. Port Dupon, Leyte Island. March 17, 1909. Length, 105 mm.
5 examples, Port Jamelo, Luzon. July 13, 1908. Length, 60 to 74 mm.
52 to 54. Port Langcan, Palawan Island. April 8, 1909. Length, 78 to 86 mm.
21143. Port Maricaban. July 21, 1908. 2 examples. Length, 100 to 107 mm.
6 examples, Port Matalvi, Luzon. November 22, 1908. Length, 82 to 103 mm.
2 examples, Port Matalvi. November 23, 1908. Length, 92 to 98 mm.
1 example, Port Palapag. June 2, 1909. Length, 65 mm.
2 examples, Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 102 to 106 mm.
1 example, Port Uson, west of Pinas Island. December 17, 1908. Length, 85 mm.
6 examples, Pujada Bay. May 5, 1908. Length, 90 to 103 mm.
2 examples, Quinalasag Island, Masamat Bay. June 12, 1909. Length, 73 to 82 mm.
7 examples, Rapu Rapu Island. June 22, 1909. Length, 76 to 98 mm.
2 examples, Rasa Island, Mantaquin Bay, Palawan. April 1, 1908. Length, 87 to 90 mm. [6395.]
2 examples, Romblon. March 16, 1908. Length, 75 to 95 mm.
3 examples, Romblon Harbor. March 25, 1908. Length, 82 to 108 mm.
14759 and 14760, 20049. Romblon. March 26, 1908. Length, 53 to 103 mm.
14789. Sablayan, Mindoro. December 12, 1908. Length, 108 mm.
12 examples, Sablayan. December 13, 1908. Length, 59 to 112 mm.
10923. San Miguel Harbor, Ticao Island. 5 examples. April 21, 1908. Length, 78 to 113 mm.
12676. San Miguel Island. June 4, 1909. Length, 95 mm.
4 examples, San Roque, Leyte Island. July 29, 1908. Length, 84 to 106 mm.
1 example, Surigao, Mindanao. May 8, 1908. Length, 87 mm.
9 examples, Taganak Island. January 7, 1909. Length, 53 to 100 mm.
14385, 14389, 14408, 22847. Talisse Island. November 9, 1909. 6 examples. Length, 85 to 103 mm.
20707. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 100 mm.
6 examples, Tanakeke Island. December 21, 1909. Length, 76 to 96 mm.
1 example, Tapiantana Island. September 13, 1909. Length, 100 mm.
3 examples, Tara Island. December 14, 1908. Length, 98 to 105 mm.
5 examples, Tara Island. December 15, 1908. Length, 89 to 98 mm. [802.] Greenish-blue, with 3 or 4 blackish bars; fins without markings; lower surface silvery.
14 examples, Tataan, Simulac Island. February 20, 1908. Length, 67 to 96. [175.] Beryl green, becoming bluish below; crossed by 3 indistinct bars under spinous part of dorsal, slightly dark; top of head darker. Dorsal spines bluish, membranes body color; posterior part of dorsal paler. Caudal pale; edges dusky black. Anal very pale blue, spines with yellowish shade; ventral similar, tip of first ray white. Pectoral very pale dusky, with an indistinct spot at top of base. [176.] Same as above, dusky bars more distinct and middle of side washed with yellowish. [177.] Bars become pronounced blackish, extending across entire side and fourth one appearing on caudal peduncle; some of scales of opercle and shoulder region with black centers; tip of chin dusky, with yellowish washes about snout. [178.] General colors very similar to 176, but bars obsolete; nuchal and shoulder region irregularly blotched with blackish; caudal lacks dark edges, fin uniformly dusky.
4 examples, Tilig, Lubang. July 15, 1908. Length, 76 to 110 mm.
20948 and 20949. Tomahu Island. December 11, 1909. Length, 103 to 105 mm.

14481. Tomahu Island. December 12, 1909. Length, 90 mm.
3 examples, Tulayan Island. September 15, 1909. Length, 88 to 111 mm.
20683 to 20685, 21507. Ulugan Bay, Palawan Island. December 28, 1908. Length, 72 to 98 mm.
3 examples, Varadero Bay, Mindoro. July 23, 1908. Length, 76 to 104 mm.
13623. Birabirahan Island, off Borneo. December 31, 1909. Length, 102 mm.
1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1907. Length, 104 mm.
13695. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 104 mm.
1 example, Dodepo Island and Pasejogo Island, Celebes. November 16, 1909. Length, 95 mm.
1 example, Gane Road, Gillolo Island. December 1, 1909. Length, 86 mm.
52218 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 7 examples. Length, 48 to 109 mm. Reported as *Chromis analis* by Jordan and Seale. All have the vertical dark bands largely faded out.
56146 U.S.N.M. Luzon. Philippine Commission. Length, 115 mm.
65718 U.S.N.M. Jaluit, Marshall Islands. 5 examples. Length, 95 to 125 mm.
84269 U.S.N.M. Zamboanga. Dr. F. Baker. 1 example. Length, 110 mm. Reported as *Abudefduf leucogaster* by Fowler and Bean.
27702 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. 1 example. Length, 102 mm. As *Glyphisodon leucogaster*.
31406 to 31410 A.N.S.P. Apia. Bureau of Fisheries.
49244 to 49246 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 91 to 105 mm. As *Abudefduf saxatilis* by Fowler.
31406 to 31409 A.N.S.P. Apia, Samoa. Bureau of Fisheries. Length, 88 to 98 mm. As *Chromis analis*.
47531 and 47532 A.N.S.P. Philippines. Type and paratype of *Abudefduf philippinus*. Commercial Museum of Philadelphia.

ABUDEFDUF AUREUS (Cuvier)

Glyphisodon aureus (Kuhl and Van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 479. Java.—Valenciennes, Règne Animal, Cuv. Ill., 1839, pl. 33, fig. 1.—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 22, pl. 5, fig. 1 (Batavia).

Glyphidodon aureus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 45 (Amboyna).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 405 (6), fig. 4.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (North Celebes and Macassar).

Glyphidodon (*Amblyglyphidodon*) *aureus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 109 (Java, Celebes, Amboyna).

Abudefduf aureus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 348 (Banda).

Depth 1⅔ to 1¾; head 3¼ to 3⅖, width 1½ to 1⅔. Snout 3⅛ to 3½; eye 2½ to 3, 1$\frac{1}{10}$ to 1⅙ in interorbital; maxillary reaches eye, 3$\frac{1}{10}$ to 3⅓ in head; interorbital 2⅓ to 2½, broadly convex. Gill rakers 8+17, lanceolate, moderate.

Tubes in lateral line 16, pores in straight section 9+1 to 4; 3 or 4 scales above lateral line to spinous dorsal origin, 9 or 10 below, 25 predorsal; 3 rows of cheek scales. Scales with 7 to 10 basal radiating

striae; apical denticles 128 to 139, with 1 to 4 tranverse series of basal elements; circuli very fine.

D. XIII, 11, 1 or 12, 1, thirteenth spine 1⅓ to 1½ in head, third ray 2⅔ to 3 in combined head and body; A. II, 13, 1 or 14, 1, second spine 1¼ in head, fifth ray 2⅞ to 3⅓ in combined head and body; caudal 2⅗ to 2⅘, forked; pectoral 3; ventral 2⅗ to 2⅔; least depth of caudal peduncle 1⅞ to 2 in head.

Light brown generally, paler or with buff tinge below and on soft dorsal, caudal, anal, and paired fins. Scales of head each with gray blue spot in young, smaller and less conspicuous with age. Often gray blue line along lower eye edge. In young scales of chest and breast each with gray blotch. Iris brown.

East Indies and abundant in the Philippines. The young differ a little from the adults in that the scales on the top of the head are each marked with a large blue spot bordered with dark brown. Large blue gray spots also on cheeks and opercles. Though small examples also have a single row of scales on the infraorbitals they disappear largely below and posteriorly, with age. The blue infraorbital band is always conspicuous. Small examples may also show traces of obsolete dark blotches along edge of back, first at origin of spinous dorsal, next 2 at base of spinous dorsal, and last at base of soft dorsal. Altogether the species is large, the body deep and rounded with light colors.

28 examples, Biri Channel. June 1, 1909. Length, 42 to 81 mm.

6 examples, Biri Channel. June 2, 1909. Length, 76 to 80 mm.

9493. 26 examples. Bolalo Bay, Palawan. December 21, 1908. Length, 38 to 84 mm.

1 example, Bumbum Island. September 25, 1909. Length, 80 mm.

2 examples, Busin Harbor, Burias Island. March 7, 1909. Length, 43 to 77 mm.

8 examples, Busin Harbor, Burias Island. March 8, 1909. Length, 63 to 107 mm. [314 to 316.] Dark green above, margins of scales darker; lower portions paler with silvery or golden washes; breast and lower head dusky; on lower side posteriorly centers of scales with short stripes resembling tube, giving rise to indefinite longitudinal lines; cheek and opercles with bluish-green spots showing ultramarine below. Dorsal body-color, tips of spines with slaty shades. Anal similar, but lighter. All verticals become dusky distally. Ventral with dusky green and blue shades. Pectoral plain dusky. Iris golden, with dusky.

176, 177, 179, 307. Same data. Length, 77 to 87 mm.

8 examples, Busin Harbor. June 2, 1909. Length, 73 to 79 mm.

3 examples, Busin Harbor, Burias Island. April 22, 1908. Length, 78 to 91 mm.

2 examples, Butauanan Island. June 13, 1909. Length, 64 to 80 mm.

11 examples, Candaraman Island, Balabac. January 4, 1909. Length, 58 to 92 mm.

21835. Danawan Island and Si Amil Island. September 27, 1909. 6 examples. Length, 107 to 140 mm.

1 example, Doworra Island. December 2, 1909. Length, 128 mm.

13060. Doworra Island. December 3, 1909. Length, 128 mm.
26 examples, Endeavor Strait. December 22, 1908. Length, 54 to 73 mm.
85, 106, 113. Endeavor Strait. December 23, 1908. 11 examples. Length, 56 to 80 mm.
4 examples, Endeavor Strait. December 24, 1908. Length, 43 to 72 mm.
3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 132 to 146 mm.
1 example, Gomomo Island. December 3, 1909. Length, 70 mm.
3 examples, Great Tobea Island. December 15, 1909. Length, 72 to 80 mm.
9911. Inamucan Bay, Mindanao. August 8, 1909. Length 117 mm.
4 examples, Isabel Basilan. September 11, 1909. Length, 50 to 85 mm.
3 examples, Labuan Blanda Island. December 14, 1909. Length, 73 to 140 mm.
14992. Makesi Island, Palawan. April 5, 1909. 4 examples. Length, 64 to 85 mm.
1 example, Makyan Island. November 29, 1909. Length, 90 mm.
7292. Mansalay, Mindoro. June 4, 1908. Length, 140 mm.
1 example, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 85 mm.
9 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 44 to 87 mm.
11214, 19065 to 19067. Paluan Bay, Mindoro. December 11, 1908. Length, 111 to 142 mm.
1 example, Pandanon Island. March 23, 1909. Length, 40 mm.
798. Parang, Mindanao. May 23, 1908. Length, 93 mm.
11128 and 11129 [1254]. Pasacao, Luzon Island. March 9, 1909. Length, 150 to 161 mm. General color yellow; top of head and anterior back somewhat dusky; side of head with purplish area on each scale, covering half or third its surface, margins yellow; middle of lower side with purplish or lavender shade through center of scale, becoming distinct purplish spot at center of base; these forming more or less apparent lines through second to about sixth scale row beneath lateral line; spinous dorsal olive yellow, first soft rays bright yellow, tips and fourth to last more or less dusky, giving entire vertical edge duskiness; edges of caudal lobes bright yellow, body of fin dusky; anal bright cadmium yellow, vertical edge narrowly dusky; ventrals similar to anal; pectoral yellow but paler.
3 examples, Port Caltom. December 15, 1908. Length, 45 to 93 mm.
3 examples, Port Galera, Mindoro. October 27, 1909. Length, 122 to 165 mm.
6 examples, Port Maricaban. July 21, 1908. Length, 115 to 138 mm.
1 example, Port Matalvi, Luzon. November 23, 1908. Length, 41 mm.
10 examples, Port Uson west of Pinas Island. December 17, 1908. Length, 41 to 68 mm.
4 examples, Powati Harbor, Makyan Island. November 28, 1909. Length, 54 to 120 mm.
4 examples, Pujada Bay, east Mindanao. May 15, 1908. Length, 98 to 102 mm.
3 examples, Rasa Island, Mantaquin Bay, Palawan Island. April 1, 1909. Length, 60 to 85 mm.
6 examples, Romblon Harbor. March 25, 1908. Length, 57 to 93 mm.
14 examples, Romblon Harbor. March 26, 1908. Length, 52 to 83 mm.
10 examples, Sacol Island. September 9, 1909. Length, 47 to 79 mm.
7 examples, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 50 to 100 mm.
14172 and 14173. Santa Cruz, Marinduque Island. April 24, 1908. 3 examples. Length, 73 mm.

1 example, Simaluc, Bisibisi. September 23, 1909. Length, 54 mm.
3 examples, Tara Island. December 14, 1908. Length, 85 to 87 mm.
9 examples, Tara Island. December 15, 1908. Length, 55 to 92 mm.
1 example, Tataan Island, Simulac Island. February 18, 1908. Length, 75 mm.
1 example, Tataan Island. February 20, 1908. Length, 87 mm.
3 examples, Tulnalutan Island. September 9, 1909. Length, 122 to 132 mm.
2 examples, Tumindao Island. February 26, 1908. Length, 48 mm.
1 example, Tutu Bay, Jolo Island. September 19, 1909. Length, 90 mm.
2 examples, Tutu Bay, First Anchorage, Jolo Island. September 19, 1909. Length, 73 to 75 mm.
5 examples, Ulugan Bay, channel north of Oyster Inlet. December 28, 1908. Length, 68 to 93 mm.
244 and 245. Ulugan Bay. December 29, 1908. Length, 36 to 57 mm.
14324. Basa Reef, Gulf of Boni, Celebes, Dutch East Indies. December 17., 1909. Length, 140 mm.
13432. Buka Buka Island, Celebes. November 20, 1909. Length, 123 mm.
1 example, Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 142 mm.
14847, 14848, 14850. Dodepo and Pasejogo Islands, Celebes. 4 examples. November 16, 1909. Length, 98 to 128 mm.
20038. Limbe Strait, Celebes. November 10, 1909. Length, 130 mm.
13656. Sadaa Island, Celebes. November 17, 1909. Length, 120 mm.
13638 and 14921. Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. 6 examples. Length, 120 to 145 mm.
3 examples, west of Malibagu Point, Gulf of Tomini, Celebes. November 21, 1909. Length, 130 to 140 mm.
15035. Tidore Island, south of Ternate. November 24, 1908. 148 mm.

ABUDEFDUF UNIMACULATUS (Cuvier)

Glyphisodon unimaculatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 478 Timor.—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 23, pl. 6, fig. 1 (Java, Sumatra, South Borneo).

Glyphidodon unimaculatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 51 (Borneo).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Borongan, Samar).

Glyphidodontops unimaculatus Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 140 (Sumatra, Cocos Islands, Java, Bawean, Borneo, Celebes, Sangi, Timor, Ternate, Halmahera, Buru, Amboyna, Harueu, Ceram, Goram, Cebu?).

Chrysiptera unimaculata Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).

Abudefduf unimaculatus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 784 (Negros).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Calayan).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 354 (Kangeang, Lombok, Sumba, Savu, Menado, Beo, Lirung, Kabaëna, Nusa Laut, Rotti).

Glyphidodon dispar Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 54. Amboyna.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 548 (Luzon, Bitangas Nesuglin).

Glyphidodon leucogaster (not Cuvier) Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 5 (not 6).

Chrysiptera modesta (not Schlegel and Müller) Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).

Abudefduf antjerius (not Cuvier) Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).—Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 54 (Philippines).

Depth 2⅕ to 2⅓; head 3 to 3⅓, width 1⅔ to 1⅘. Snout 3¼ to 3½; eye 3 to 3⅛, about equals snout or interorbital, larger in young; maxillary ⅘ to eye, to front eye edge in young, 3⅙ to 3¼ in head; interorbital 3⅖ to 4⅛, broadly convex. Gill rakers 8+14, lanceolate.

Tubes 17 in lateral line, pores in straight section 7 or 8+ 1 or 2; 3 scales above lateral line to spinous dorsal origin, 8 below, 14 predorsal; 2 rows of cheek scales, infraorbital and preopercle flange naked. Scales with 9 or 10 basal radiating striae; apical denticles 68 to 125, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XIII, 13, 1, variably 9, 1, thirteenth spine 2 to 2¼ in head, seventh ray 1⅗ to 2⅖; A. II, 12, 1, second spine 2 to 2⅛, seventh ray 1⅓ to 1½; caudal 1 to 1⅛, well emarginate; least depth of caudal peduncle 2 to 2⅛; pectoral $1\frac{1}{10}$ to 1⅛; ventral 2¼ to 3¼ in combined head and body.

Body largely uniform chocolate brown, bases of scales only showing slightly darker. Usually short gray blue line on side of snout to eye and another usually broader, more extensive, along lower edge of infraorbital. Some examples with gray blue spots on cheek and opercle. Some examples also show gray lines or vertical blotches on some of scales on costal region, variably extensive. Iris brown. Dorsals brownish, paler basally, margin of spinous fin rather deep grayish and blackish blotch, variably rounded to angular on last dorsal rays basally. Also sometimes it extends backward little on front of caudal peduncle. None of our examples show it ocellated as in Bleeker's figure. Caudal and caudal peduncle pale yellowish brown, uniform, or even hind marginal portion of caudal lobes little brownish. Anal dusky brown. Pectoral pale yellowish, rarely or symmetrically with dusky blotch and upper front edge of fin narrowly dusky. Ventral dusky, often little paler, at least marginally, in young.

East Indian region. Our specimens agree largely with Bleeker's figure, except as now preserved all have pale uniform caudal peduncle and caudal fin in contrast. Some also show abdomen or breast quite pale. This is one of the smaller, modestly colored species, though the black blotches variable.

1 example, Batan, Rapurapu Strait. June 5, 1909. Length, 27 mm. [1606.] Body slaty; top of head and anterior body bright red; median and three lateral stripes above eye of narrow blue, limited on each side with black; these break into dots posteriorly; below eye two or three irregular stripes of dots parallel to above; dorsal red, crossed by about three bars of blue; large black centered blue-rimmed ocellus on soft fin; caudal yellow, base whitish; anal dusky; ventrals blackish; pectorals dusky yellow with small black spot in upper axil.

1 example, Batan Island. June 5, 1909. Length, 64 mm. [1599.]
47 examples, Batan Island. June 5, 1909. Length, 38 to 68 mm.
26 examples, Batan Island. July 22, 1908. Length, 26 to 70 mm.
1 example, Bolalo Bay, Palawan Island. December 12, 1908. Length, 65 mm.
27 examples, Canimo Island near Daet. June 15, 1909. Length, 27 to 43 mm.
1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 68 mm.
1 example, Endeavor Strait, beach at village near Chase Head, Palawan. December 22, 1908. Length, 60 mm.
5 examples, Gubat Bay, Luzon. June 23, 1909. Length, 41 to 59 mm.
2 examples, Inamucan Bay, Mindanao. August 9, 1909. Length, 63 mm.
18 examples, Maculabo Island. June 14, 1909. Length, 52 to 80 mm.
1 example, Mahinog, Camiguin Island, from torch fisherman. August 2, 1909. Length, 59 mm.
2 examples, Mahinog. August 3, 1909. Length, 57 or 58 mm.
1 example, Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 68 mm.
69 examples, Nogas Point, Panay. February 4, 1908. Length, 22 to 73 mm.
21 examples, Pilas Island. September 12, 1909. Length, 31 to 68 mm.
1 example, Port Uson Island, west of Pinas Island. December 17, 1908. Length, 55? mm.
11614 to 11616. Sablayan, Mindoro. December 12, 1908. Length, 47 to 69 mm.
23 examples, Sablayan, Mindoro. December 13, 1908. Length, 52 to 57 mm. [764.]
1 example, Sirinao Island Reef. December 31, 1908. Length, 70 mm.
15107 U.S.N.M. Samoa. A. B. Steinberger. 3 examples. Length, 9 to 40 mm.
51967 U.S.N.M. Negros. Dr. B. Dean. 2 examples. Length, 64 to 69 mm.
56145 U.S.N.M. Bacon. Philippine Commission. 1 example. Length, 70 mm.
27676 to 27683 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 40 to 90 mm. As *Chrysiptera modesta.*
27684 to 27697 A.N.S.P. Padang. Messrs. Harrison and Hiller. Length, 45 to 102 mm. As *Chrysiptera unimaculata.* No dark spot on last dorsal rays basally.
47674 and 47675 A.N.S.P. Philippines. Philadelphia Commercial Museum. Length, 55 to 61 mm. As *Abudefduf antjerius.*

ABUDEFDUF DICKII (Liénard)

Glyphisodon dickii Liénard, Dix. Rap. Soc. Hist. Nat. Maurice, 1839, p. 35. Mauritius.—Sauvage, Hist. Nat. Madagascar, Poiss, 1891, p. 432.
Glyphidodon dickii Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 7.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 232, pl. 125, fig. C (Mauritius, East Indies, Samoa, Ponape).
Glyphidodon (*Stegastes*) *dickii* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 115 (Timor, Ceram, Amboina).
Abudefduf dicki Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 36 (Cagayancillo).
Abudefduf dickii Weber, Siboga Exp., vol. 57, Fische, 1913, p. 350 (Borneo Bank).
Glyphidodon unifasciatus Kner and Steindachner, Sitz. Akad. Wiss. Wien, vol. 54 (1), 1867, p. 375, pl. 2, fig. 3. Upolu, Samoa.

Depth 1¾ to 1⅘; head 2⅞ to 3, width 1⅗ to 1⅔. Snout 3 to 3⅛; eye 3¼ to 3⅗, 1 to 1¼ in snout, 1 to 1¼ in interorbital; max-

illary reaches eye, 3½ to 3⅗ in head; interorbital 3 to 3⅛, convex. Gill rakers 6+14, lanceolate, short.

Tubes in lateral line 21, pores in straight section 6+1 or 2; 3 scales above lateral line to spinous dorsal origin, 11 below, 22 predorsal; 5 rows of cheek scales, of which uppermost row on infraorbitals. Scales with 10 to 12 basal radiating striae; apical denticles 92 to 125, with 1 to 4 transverse series of basal elements.

D. XIII, 17, 1, twelfth spine 1½ to 1⅔ in head, fourth ray 2⅗ in combined head and body, 1⅕ in head in young; A. II, 14, 1, second spine 1½ to 1¾, sixth ray 1 to 1¼; caudal forked, 2⅕ in combined head and body; least depth of caudal peduncle 1⅞ to 2⅛ in head; pectoral 1$\frac{1}{10}$ to 1⅛; ventral 1 to 1⅕.

Brown generally, slightly paler below. On body each scale with slightly darker marginal border, producing a reticulated appearance. Head little pale, brown on sides, scales on cheeks and opercles with faint gray blotches, evidently pale blue in life. Also gray band from near snout end to eye and another along suborbital, these also likely pale blue in life. From front of soft dorsal base to posterior median anal rays basally broad dusky or blackish brown band, 3 or 4 scales in width. Dorsals brownish, last rays and posterior portion of fin, together with caudal peduncle and caudal fin pale yellowish or buff. Anals brownish, more or less dusky terminally. Pectoral pale yellowish white. Ventral dusky, little paler or whitish basally. Iris brown.

Indo-Pacific from Mauritius to the East Indies and Samoa. A rare though well marked species. Among all of its genus it may easily be known by the dark vertical band joining the soft dorsal and anal fins. Günther's figure is quite different from any we have seen, as the lateral line is shown continuously along the upper side of the caudal peduncle, to the base of the caudal.

2 examples, Cuyo, Cuyo Island. April 9, 1909. Length, 100 to 103 mm.

[1212.] Philippines. Length 98 mm.

1 example, Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 73 mm.

1 example, San Roque, Leyte. July 29, 1909. Length, 98 mm.

19073. Silino Island. August 10, 1909. Length, 107 mm.

19102. Silino Island. August 10, 1909. Length, 99 mm.

10764. Sipadan Island. September 28, 1909. 3 examples. Length, 93 to 107 mm.

1 example, Usada Island, near Jolo. March 3, 1908. Length 55 mm. [368.] Pectoral cadmium. Caudal dusky pink. General color olive with pinkish shades.

14068. Uki, Bouro Island, Dutch East Indies. December 9, 1909. Length, 90 mm.

52406 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 3 examples. Length, 85 to 112 mm.

ABUDEFDUF LEUCOZONUS (Bleeker)

Glyphisodon leucozona Bleeker, Nat. Tijds. Ned. Indie, vol. 19, 1859, p. 339. Karangbollong, Java.

Glyphidodon leucozona Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 49 (Java).—Kner, Sitz. Akad. Wiss. Wien, vol. 58, 1868, p. 350 (Savay).—Bleeker, Atlas Ich. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 2.—Regan, Ann. Durban Mus., vol. 2, 1917–20, p. 76 (Natal).

Glyphisodon (Stegastes) leucozona Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 112 (Java and Solor).

Abudefduf leucozona Weber, Siboga Exp., vol. 57, Fische, 1913, p. 349 (Savu).

Glyphidodon florulentus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 49. Indian Ocean.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Luzon, Manila Bay).—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Seychelles, Coetivy).

Glyphidodon cingulatum Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 526. Red Sea.

Glyphidodon cingulatus Cartier, Verh. Ges. Wurzburg, vol. 5, 1874, p. 101 (Ubay, Bohol).

Depth 1⅞; head 3⅓. Snout 2⅞; eye 2¾, little greater than snout; maxillary nearly reaches opposite front eye edge, 2⅞ in head; interorbital convex; suborbital and preopercle edges entire.

Tubes in lateral line 21; pores in straight section 8?; 4 scales above lateral line, 10 below, 14 or 15 predorsal; preorbital and infraorbital scaled, and 4 more rows on rest of cheek.

D. XII, 15 to 17, fifth spine 1⅗ in head, fifth ray 1⅛; A. II, 12 to 14, second spine 1⅔, fifth ray 1¼; caudal 1, little emarginate behind; least depth of caudal peduncle 1⅘; pectoral 1; ventral 3 in combined head and body.

Brown or olive brown, vertical and ventral fins violaceous or golden brown. Young with transverse whitish band from front of soft dorsal down before vent. Iris purple-violet, margined with golden. Black ocellus at front of soft dorsal and last dorsal spines, with white border. Length 55 to 77 mm. (Bleeker.)

Red Sea, Natal, East Indies, Philippines. We have no materials.

ABUDEFDUF AZUREPUNCTATUS, new name

Glyphisodon lacrymatus (not Quoy and Gaimard) Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 404 (3), fig. 6.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 232, pl. 125, fig. D (Howland Island).

Depth 1⅞ to 2; head 3⅛ to 3¼, width 1⅔ to 1⅞. Snout 3½ to 3⅗; eye 2¾ to 3¼, 1 to 1¼ in interorbital; maxillary to eye, or little beyond front eye edge, 2⅔ to 3 in head; interorbital 2⅞ to 3, broad, convex. Gill rakers 8+16, lanceolate, long, slender.

Tubes in lateral line 14 or 15, pores in straight section 9+1 or 2; 4 scales above lateral line to spinous dorsal origin, 9 below, 15 predorsal; 3 rows of cheek scales, variably present or absent on infraorbital. Scales with 7 or 8 basal radiating striae; apical denticles 71 to 111, with 2 or 3 transverse series of basal elements; circuli fine.

D. XIII, 11, 1, thirteenth spine 1¾ in head, fifth ray 1⅛ to 1½; A. II, 12, 1, second spine 1⅔ to 2, sixth ray 1 1/10 to 1⅙; least depth of caudal peduncle 1⅞ to 2; caudal 2⅘ to 3 in combined head and body, deeply emarginate, upper lobe often little longer; pectoral 3⅛ to 3⅗; ventral 2⅞ to 3⅓.

Largely uniform brown, shading little paler on belly and under surface. Scale below origin of lateral line with deep or dusky basal spot, so usually conspicuous. Inconspicuous small gray spots or dots scattered over lower surface of body, especially over anal base and adjacent region. Fins all pale brown, edge of spinous dorsal little deeper. Iris brown and gamboge. No dark spots anywhere on fins. Other examples show whole body finely dotted with gray blue, 1 to 4 or 5 on each of larger scales and usually a pronounced row of larger gray dots along lower edge of abdomen. Blue dots on head usually inconspicuous and scattered and no line on infraorbitals.

Widely distributed in the Indo-Pacific, from the East Indies to Oceania. It bears a great resemblance to the young of *Abudefduf aureus*, but may readily be known by the dark scale below the origin of the lateral line and the absence of large conspicuous blue spots on the head and breast. It is not the *Glyphidodon lacrymatus* Quoy and Gaimard as the presence of blue or gray spots, thickly sprinkled over the lower surface of the body shows.

Type.—Cat. No. 89963, U.S.N.M.

5 examples, Bolalo Bay, Palawan. December 21, 1908. Length, 54 or 55 mm.

1 example, Busin Harbor, Burias Island. March 7, 1909. Length, 48 mm.

311. Busin Harbor. March 8, 1908. Length, 47 mm.

5 examples, Busin Harbor. April 23, 1908. Length, 38 to 65 mm.

4 examples, Candaraman Island, Balabac Island. January 4, 1909. Length, 49 to 72 mm.

1 example, Danawan Island and Si Amil Island. September 26, 1909. Length, 55 mm.

14284. Endeavor Strait. December 22, 1908. 2 examples. Length, 48 mm.

74, 82, 83, 97, 99, 101. Endeavor Strait. December 23, 1908. 24 examples. Length, 45 to 69 mm.

2 examples, Great Tobea Island. December 15, 1909. Length, 57 to 60 mm.

19966. Makesi Island, Palawan. April 5, 1909. 2 examples. Length, 42 to 64 mm.

1 example, Mantacao Island, west coast Bohol. April 9, 1908. Length, 59 mm.

3 examples, Pendek Island. December 15, 1909. Length, 55 to 61 mm.

1 example, Philippines. Length, 50 mm.

[499.] Philippines. Length, 59 mm.

1 example, Port Matalvi, Luzon. November 22, 1908. Length, 50 mm.

11 examples, Port Matalvi. November 23, 1908. Length, 39 to 64 mm.

1 example, Port Uson, Busuanga Island. December 19, 1908. Length, 56 mm.

[946.] Green, numerously specked with bright blue on back and upper side; dorsal dusky at tip; caudal dusky, yellowish at base; anal and ventrals bright yellow; very small black blotch at upper angle of opercle; iris blue.

1 example, Pujada Bay, Mindanao. May 5, 1908. Length, 45 mm.

20082. River, Nakoda Bay, Palawan Island. December 31, 1908. Length, 55 mm.
7 examples, Romblon Harbor. March 25, 1908. Length, 50 to 70 mm.
20 examples, Romblon Harbor. March 26, 1908. Length, 40 to 68 mm. Types.
2 examples, Sacol Island. September 9, 1909. Length, 62 to 68 mm.
1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 50 mm.
1 example, Santa Cruz Island, Marinduque. April 24, 1908. Length, 82 mm.
1 example, Talisse Island. November 9, 1909. Length, 58 mm.
1 example, Ulugan Bay, channel north of Oyster Inlet. December 28, 1908. Length, 50 mm.
1 example, Batjan Island, Dutch East Indies. June 5, 1909. Length, 46 mm.

(*Azura*, azure blue; *punctatus*, spotted.)

ABUDEFDUF LACRYMATUS (Quoy and Gaimard)

Glyphisodon lacrymatus Quoy and Gaimard, Voy. Uranie, Zool., 1825, p. 388, pl. 62, fig. 7. Guam.—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 478 (Guam).

Glyphidodon lacrymatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 49 (copied).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 527 (Koseir, Red Sea).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 440 (Batjan and Ternate).

Glyphidodon (*Stegastes*) *lacrymatus* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 111 (Sumatra, Java, Timor, Sangi, Ternate, Ceram).

Abudefduf lacrymatus Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 285 (Apia, Samoa).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 349 (Borneo Bank, Salibalou, Rotti, Timor).

Glyphisodon nivosus Hombron and Jacquinot, Voy. Astrolabe, Zool., vol. 3, 1853, p. 50, pl. 5, fig. 5. No locality.

Glyphidodon nivosus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 47 (copied).

Depth 1⅘ to 1⅞; head 3 to 3⅛, width 1⅗ to 1¾. Snout 3 to 3⅛; eye 3 to 3⅖, 1 to 1⅛ in snout, 1 to 1$\frac{1}{10}$ in interorbital; maxillary reaches eye, 3⅓ to 2⅖ in head; interorbital 2⅞ to 3, broadly convex. Gill rakers 10+13, lanceolate, slender, rather short.

Tubes in lateral line 17 to 19, pores in straight section 8+1 to 2; 3 scales above lateral line to spinous dorsal origin, 10 below, 20 or 21 predorsal; 5 rows of cheek scales, of which uppermost row on infraorbital. Scales with 7 or 8 basal radiating striae; apical denticles 104 to 130, with 2 or 3 transverse series of basal elements; circuli fine.

D. XII, 16, 1, twelfth spine 1¾ to 1⅘ in head, fifth ray 1⅕ to 1⅗; A. II, 13, 1, second spine 1¾ to 1$\frac{9}{10}$, fifth ray 1⅕ to 1½; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅛; caudal 2¼ to 2⅘ in combined head and body, fin forked and upper lobe usually little longer; pectoral 3 to 3⅛; ventral 2⅔ to 3⅛.

Dusky chocolate generally, with small blue gray spots or dots scattered over head, especially above on back, those on cheek and opercle much larger. Small blue gray spots numerous over dorsals basally. A small blue gray spot sometimes on sides of breast.

Caudal peduncle and caudal fin usually yellowish or buff white, uniform, though sometimes slightly dusky. Iris brown or yellowish. Spinous dorsal dusky, also soft dorsal over greater anterior portion, posteriorly sometimes pale to whitish. Anal fin always dusky black. Pectoral brown, with large blackish blotch basally. Ventral dusky black.

Red Sea, East Indies, Guam, Samoa. The widely scattered blue dots on the back, together with the yellowish caudal and blackish ventrals and anal, will serve to distinguish this species.

The figure by Hombron and Jacquinot shows the pale posterior area of the soft vertical fins and caudal peduncle more extensive than in any of our examples. Also it is without the dark blotch at the pectoral base or large blue spots on the cheeks and opercles.

1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 85 mm.

5 examples, Balikias Bay, Lubang Island. July 17, 1908. Length, 77 to 87 mm.

3 examples, Batan Island. June 5, 1909. Length, 90 to 95 mm.

16 examples, Biri Channel. June 1, 1909. Length, 65 to 73 mm.

2 examples, Bolalo Bay, Palawan. December 21, 1908. Length, 90 to 95 mm.

3 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 97 to 102 mm.

6 examples, Bubuan Island, Jolo. February 14, 1908. Length, 61 to 80 mm.

3 examples, Bugsuk Island, Balabac. January 5, 1909. Length, 92 to 94 mm.

13 examples, Butauanan Island. June 13, 1909. Length, 80 to 98 mm.

1 example, Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 80 mm.

18 examples, Candaraman Island, Balabac. January 4, 1909. Length, 80 to 90 mm.

11 examples, Canimo Island, near Daet. June 15, 1909. Length, 82 to 98 mm.

1 example, Casogoran, Malhon Island. July 27, 1909. Length, 94 mm. [1709.] Bases of scales on upper side and back blackish, covering entire scale on top of head and anterior back; narrows down until breast and abdominal side become gray; peduncle and caudal fin with marked brownish yellow shades; chin, preorbital and lower portion of cheek with brownish and green shades; preorbital and side of head probably with purplish blotches when fish somewhat faded; above and behind eye, on top of head and along back small bright blue specks, these sometimes somewhat ocellate; dorsal with spinous membranes blackish, with paler band through upper portion of scaled portion below; vertical half of rayed dorsal with rays yellowish brown, membranes more dusky; anal very dark brown, second spine more or less bluish; ventrals blackish; pectorals dusky, base black in and outside; iris golden.

2 examples, Cuyo, Cuyo Island. April 9, 1909. Length, 85 to 89 mm.

4 examples, Dalaganem Island. April 8, 1909. Length, 78 to 88 mm. 7426 B. F.

3 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 75 to 85 mm.

2 examples, Doworra Island. December 2, 1909. Length, 81 to 89 mm.

2 examples, Galera Bay, Mindoro. June 9, 1908. Length, 84 to 95 mm.

2 examples, Gomomo Island. December 3, 1909. Length, 78 to 87 mm.

8 examples, Jolo. March 6–7, 1908. Length, 76 to 89 mm. [432.]

1 example, Labuan Blanda Island. December 14, 1909. Length, 73 mm.

1 example, Langao Point, Luzon. June 24, 1909. Length, 90 mm.
1 example, Libig, Lubang Island. July 14, 1908. Length 80 mm.
4 examples, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 83 to 94 mm.
14819, 14820, 14823, 14831. Little Santa Cruz. March 26, 1908. 5 examples. Length 66 to 87 mm.
1 example, Little Santa Cruz Island. May 28, 1908. Length, 87 mm.
10 examples, Mactan Island, Cebu. March 25, 1909. Length, 71 to 93 mm.
14566 and 14567. Maculabo Island. June 14, 1909. 15 examples. Length, 78 to 98 mm.
22046. Maganas, Lagonoy Gulf, Luzon. June 17, 1909. Length, 90 mm.
1 example, Makyan Island. November 29, 1909. Length, 105 mm.
1 example, Malapascua Island. March 16, 1909. Length, 88 mm.
5 examples, Mansalay, Mindoro. June 4, 1908. Length, 77 to 90 mm.
2 examples, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length 81 to 82 mm.
2 examples, Mompog Island. March 3, 1909. Length, 75 to 95 mm.
1 example, Murcielagos Bay, Mindanao. August 9, 1909. Length, 66 mm.
6 examples, Murcielagos Bay. August 21, 1909. Length, 78 to 92 mm.
1 example, Opol, Mindanao. August 4, 1909. Length, 92 mm.
1 example, Oyster Inlet, Ulugan Bay. December 28, 1908 Length, 99 mm.
22076. Pagapas Bay, Luzon. February 20, 1909. Length, 97 mm.
4 examples, Pangasinan Island. February 13, 1908. Length, 57 to 74 mm.
7 examples, Porongpong Island, Palumbanes Group. June 11, 1909.
14364. Paron Point, Albay Gulf, Luzon. June 21, 1909. 2 examples. Length, 88 to 90 mm.
1 example, Panpan, Tara Island. September 20, 1909. Length, 90 mm.
2 examples, Philippines. Length, 77 to 79 mm.
14950 and 14957. Port Ciego, Balabac Island. January 3, 1909. Length, 89 to 98 mm.
15132. Port Dupon, Leyte Island. March 17, 1909. Length 90 mm.
58. Port Langao, Palawan Island. April, 1909. Length, 90 mm.
1 example, Port Maricaban. July 21, 1908. Length, 73 mm.
1 example, Port Matalvi, Luzon. November 22, 1908. Length, 87 mm.
13840. Powati Harbor, Makyan Island. November 28, 1909. Length, 104 mm.
7 examples, Pujada Bay, Mindanao. May 15, 1908. Length, 81 to 90 mm.
10754, 13198. Quinalasag Island, Masamat Bay. June 12, 1909. 11 examples. Length, 83 to 99 mm.
1 example, Rapu Rapu Island. June 22, 1909. Length, 93 mm.
3 examples, Sablayan, Mindoro. December 13, 1809. Length, 80 to 90 mm.
1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length 55 mm.
12220. Santa Cruz Island, Marinduque. April 24, 1908. Length, 87 mm.
1 example, Simaluc, Bisibisi. September 23, 1909. Length, 80 mm.
1 example, Talisse Island. November 9, 1909. Length, 85 mm.
1 example, Tanakeke Island. December 21, 1909 Length, 83 mm.
5 examples, Tara Island. December 14, 1908. Length, 87 to 97 mm.
9 examples, Tara Island. December 15, 1908. [789.] Length, 74 to 98 mm. General color slaty; caudal and vertical edges of dorsal with yellowish shades; back and scale base of dorsal sparsely covered with paired blue specks.
14478 and 14480. Tomahu Island. December 12, 1909. Length, 80 to 83 mm.
14008. West coast of Palaui Island. November 18, 1908. Length, 62 mm.
13625. Birabirahan Island, off Borneo. December 31, 1909. Length, 100 mm.

ABUDEFDUF BONANG (Bleeker)

Glyphisodon bonang Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1853, p. 522· Padang, Sumatra.—Franz, Abh. Bayer. Akad. Wiss., 1910, p. 58 (Aburatsubo, Japan).

Glyphidodon bonang Günther, Cat. Fish. Brit. Mus., vol. 4, 1962, p. 45 (East Indies).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (North Celebes).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Luzon and Manila Bay).

Paraglyphidodon bonang Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 1.—Bleeker, Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 118 (Sumatra, Java).

Glyphidodon mutabilis Cartier, Verh. Ges. Phys. Med. Ges. Würzburg, vol. 5, 1874, p. 100. Cebu.—Elera, Cat. Fauna Filip., vol. 1, p. 546 (Cebu).

Depth 2⅕ to 2¼; head 3⅛ to 3¼, width 1⅗ to 1¾. Snout 3¾ to 4; eye 2⅔ to 3, greater than snout or interorbital; maxillary reaches eye, 3¼ to 3⅓ in head; interorbital 3 to 3¼, broadly convex. Gill rakers 6+16, lanceolate, long.

Tubes in lateral line 13 to 16, pores in straight section 7 or 8+2; 2 or 3 scales above lateral line to spinous dorsal origin, 8 below, 15 or 16 predorsal; 4 rows of cheek scales of which uppermost on infraorbital. Scales with 7 to 9 basal radiating striae; apical denticles 78 to 84, with 2 transverse series of basal elements; circuli very fine.

D. XIII, 10, 1 to 12, 1, fifth spine 1⅞ to 2⅛ in head, fifth ray 1⅓ to 1⅔; A. II, 11, 1 or 12, 1, second spine 1⅔ to 1⅗, fifth ray 1¼ to 1⅔; least depth of caudal peduncle 1⅘ to 2⅙; pectoral 1 to 1⅙; caudal 2⅘ to 3¼ in combined head and body, deeply emarginate; ventral 2⅘ to 3⅕.

Pale brown generally, little paler below, each scale with grayish basal blotch or bar. Blue gray line on side of snout to eye. Each scale of cheek with blue gray basal spot, also predorsal, chest, breast, and body along bases of dorsals and anals with blue spots or dots. Also some examples with blue gray blotches of large size on scales of caudal peduncle above. Iris brown. Fins all pale, spinous dorsal and anal usually with some brown. A large black blotch at bases of last 4 dorsal spines and extended below slightly on back. Anal papilla black. Paired fins pale or yellowish.

East Indies to Japan. A striking species, suggestive of *Abudefduf leucozona*, with the black ocellus at last spines of dorsal. *A. leucozona* differs in the presence of a whitish vertical band on the body from the front of the spinous dorsal.

There is little doubt but that Cartier's *Glyphidodon mutabilis* is the present species. Though he gives the D. XIII, 13, A. II, 14 and the scales 25 his examples were 45 to 75 mm. Bleeker has given the D. XIII, 15 or 16, A. II, 13 or 14 and the scales 28, but his examples were 58 to 150 mm. long. The presence of but 2 or 3 more soft rays is hardly a specific difference.

1 example, Caracaran, Batan Island. June 8, 1909. Length, 46 mm.
3 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 47 or 48 mm.
1 example, Mabul Island. September 29, 1909. Length, 46 mm.
11384. Mahinog, Camiguin Island. August 3, 1909. Length, 53 mm.
1 example, Murcielagos Bay, Mindanao. August 21, 1909. Length, 49 mm.
1 example, Port Banalacan, Marinduque. February 23, 1909. Length, 35 mm.
1 example, Tidore Island, south of Ternate. November 24, 1909. Length, 47 mm.

ABUDEFDUF XANTHURUS (Bleeker)

Glyphisodon xanthurus BLEEKER, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 345. Amboina.
Glyphidodon xanthurus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 47 (Ceram).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 396 (Amboina R.).
Paraglyphidodon xanthurus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 405 (6), fig. 3.—BLEEKER, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 122 (Flores, Sangi, Obi major, Ceram, Amboina).
Abudefduf xanthurus EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 92 (Bacon).

Depth 1⅘ to 1⅞; head 3⅛ to 3¼, width 1⅔ to 1⅘. Snout 3⅛ to 4; eye 2⅞ to 3½, greater than snout or interorbital; maxillary reaches eye, 3½ to 3⅗ in head; teeth uniserial, compressed, ends rounded; interorbital 2⅘ to 3, broadly convex. Gill rakers 9+17, lanceolate, long, slender.

Tubes in lateral line 16 or 17, pores in straight section 7 or 8+2 or 3; 4 scales above lateral line, 9 or 10 below, 20 to 23 predorsal; 4 rows of cheek scales, of which uppermost row on infraorbital. Scales with 9 or 10 basal radiating striae; apical denticles 117 to 155, with 3 or 4 transverse series of basal elements; circuli very fine.

D. XIII, 14, 1 or 15, 1, thirteenth spine 1⅘ to 1⅔ in head, sixth ray 2½ to 3⅛ in combined head and body; A. II, 13, 1 or 14, 1, second spine 1⅘ to 1⅞ in head, sixth ray 2⅞ to 3⅕ in combined head and body; caudal 2⅖ to 2⅔, deeply forked; pectoral 2¾ to 2⅞; ventral 2⅕ to 2⅖; least depth of caudal peduncle 1⅞ to 2⅙ in head.

Chocolate brown generally, uniform on head and body. Along hind preopercle edge dusky vertical band, also hind edge of opercle dusky. Dorsals and anals brownish, edge of spinous dorsal and lower anal edge dusky, posterior portion of soft dorsal and sometimes of soft anal, together with most of caudal peduncle at least posteriorly and all of caudal, more or less pale yellowish brown to yellowish. Pectoral pale brown, with dusky black blotch at origin nearly size of pupil. Ventral dusky black. Iris brown.

East Indian region. Our examples are usually much more contrasted than Bleeker's figure and the dark markings on the head more blackish.

786 and 790. 2 examples, Agojo Point, Catanduanes Island. June 10, 1909 Length, 100 to 107 mm.
1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 95 mm.
5 examples, Balikias Bay, Lubang Island. July 17, 1908. Length, 80 to 105 mm.
2 examples, Batan Island. June 5, 1909. Length, 95 to 100 mm.
3 examples, Bolalo Bay, Palawan Island. December 21, 1908. Length, 64 to 105 mm.
11 examples, Biri Channel. June 1, 1909. Length, 78 to 94 mm.
9 examples, Biri Channel. June 2, 1909. Length, 54 to 102 mm.
3 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 110 to 127 mm.
1 example, Bugsuk, Balabac. January 5, 1907. Length, 95 mm.
2 examples, Bumbum Island. September 25, 1909. Length, 90 to 108 mm.
2 examples, Burias Island, Alimango Bay. March 5, 1909. Length, 62 to 79 mm.
1 example, Busin Harbor, Burias Island. April 23, 1908. Length, 103 mm.
7 examples, Butauanan Island. June 13, 1909. Length, 96 to 108 mm.
11 examples, Candaraman Island, Balabac. January 4, 1909. Length, 75 to 100 mm.
8 examples, Canimo Island, near Daet. June 15, 1909. Length, 98 to 103 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 90 mm.
16 examples, Capunuypugan, Mindanao. May 10, 1908. Length, 82 to 115 mm.
12738. Capulaan Bay, Pagbilao Island. February 24, 1909. 6 examples. Length, 93 to 110 mm.
1 example, Caracaran, Batan Island. June 8, 1909. Length, 110 mm.
16 examples, Casogoran, Malhon Island. July 27, 1909. Length, 85 to 112 mm. [1708.] From about base of ventrals obliquely to middle of soft dorsal line divides dark brown anterior color from dusky yellow posterior; front of opercle and flap dark brown; spinous dorsal membranes dusky cadmium, margins of membranes blackish; anal bright cadmium, front and margin more or less dusky; paired fins blackish; base of pectoral orange or cadmium, black dot at upper part of first ray.
1 example, Cataingan Bay, Masbate. April 18, 1908. Length, 102 mm.
1 example, Caxisigan Island. January 2, 1909. Length, 82 mm.
10838. Dalaganem Island. April 8, 1909. 2 examples. Length, 70 to 107 mm.
7 examples, Doworra Island. December 2, 1909. Length, 81 to 112 mm.
1 example, Endeavor Strait. December 23, 1908. Length, 66 mm.
14382. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 105 mm.
14439. Gubat, Sorgoson, Luzon. June 23, 1909. Length, 100 mm.
8 examples, Guntao Island. December 20, 1908. Length, 98 to 100 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 117 mm.
1 example, Jolo. March 6–7, 1908. Length, 92 mm.
13084. Kapoposang Island. December 28, 1909. Length, 111 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 98 mm.
2 examples, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 98 to 110 mm.
2 examples, Limbones Cove. February 8, 1909. Length, 77 to 98 mm. [1125.]
14829 and 14830. Little Santa Cruz Island. May 26, 1908. 3 examples Length, 98 to 115 mm.
1 example, Little Santa Cruz Island. May 28, 1908. Length, 100 mm.
14565. Maculabo Island. June 14, 1909. 3 examples. Length, 95 to 105 mm.

12130, 12131, 12127. Malcochin. December 19, 1908. Length, 68 to 106 mm.
12128. Malcochin Harbor, Linapacan Island. Length, 105 mm.
12347. Mansalay, Mindoro. June 4, 1908. Length, 83 to 98 mm.
14701 and 14702. Matnog Bay. May 31, 1909. Length, 94 to 110 mm.
1 example, Mompog Island. March 3, 1909. Length, 103 mm.
7 examples, Murcielagos Bay. August 9, 1909. Length, 93 to 112 mm.
1 example, Murcielagos Bay. August 21, 1909. Length, 105 mm.
1 example, Nasugbu Cove, Luzon Island. January 16, 1908. Length, 90 mm. [15.] Small specimen, with high soft verticals smoky. Tips of dorsal spines and rays, and anals black. Black bar under edge of preopercle; tip of opercle black; black spot at upper base of pectoral, with small orange spot just outside; axilary region orange shades; ventrals black; lips pale.
5 examples, Opol, Mindanao. August 4, 1909. Length, 96 to 117 mm.
5 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 104 to 123 mm.
1 example, Pagapas Bay, Luzon. February 20, 1909. Length, 110 mm.
282, 283, 11415. Paluan Bay, Mindoro. December 11, 1908. Length, 95 to 100 mm. General color bright cadmium yellow, shading toward lemon; scales on lower half of body with purplish reflections; cheek and opercle spotted with small irregular purplish specks; broken line of same under eye across preorbital; lips bright cadmium; top of head and back with dusky. Dorsal greenish-yellow, front of spines darkest; soft part bright lemon yellow, vertical edge dusky hyaline. Caudal dusky hyaline in fork, edges of lobes brilliant lemon-yellow. Anal bright cadmium. Ventral same. Pectoral pale lemon. Iris greenish. [282.]
3 examples, Philippines. Length, 100 to 103 mm.
8 examples, Polloc, Mindanao. May 22, 1908. Length, 72 to 96 mm.
1 example, Porongpong Island, Palumbanes Group. June 11, 1909. Length, 97 mm.
1 example, Port Caltom. December 15, 1908. Length, 105 mm.
14953 and 14958. Port Ciego, Balabac Island. January 3, 1909. Length, 89 to 103 mm.
2 examples, Port Jamelo, Luzon. July 13, 1908. Length, 96 to 98 mm.
49, 52, 56, 59, 61. Port Langao, Palawan Island. April 8, 1909. Length, 68 to 93 mm.
14 examples, Port Matalvi, Luzon Island. November 22, 1908. Length, 70 to 103 mm.
14583 to 14586, 14588, 14594. Port Palapag. June 3, 1909. Length, 60 to 103 mm.
10750 to 10752, 13195. Quinalasag Island, Masamat Bay. 23 examples. June 12, 1909. Length, 70 to 151 mm.
2 examples, Romblon. March 26, 1908. Length, 75 to 105 mm. [469.] With produced orange caudal; general-color slaty, becoming paler below and on caudal peduncle, meeting yellow wash; sooty bar downward across cheek under eye; another on front of opercle under posterior preopercle edge; tip of opercle blackish. Scaled portion of dorsal body-color, tip of spines and incised tips of membranes black; below dull orange; upper anterior edge of soft portion with black line, posterior rays becoming bright cadmium orange distally; caudal bright cadmium orange, edges of lobes dusky; front and anterior outer edge of anal black; vertical edge and produced rays bright cadmium orange; body of fin slate, washed with orange; ventral black; pectoral blackish dusky, upper base black, with small yellow blotch behind. Iris dusky with golden. [470.] Same as No. 469 but larger specimen; orange obscured by dusky; obscure horizontal lines on middle of sides formed by darker portion of centers of scales; orange at base of pectoral and in axil more pronounced; slight orange shade at tip of maxillary.

6403. Rasa Island, Mantaquin Bay, Palawan. April 1, 1909. Length, 97 to 100 mm. 2 examples.
14792. Sablayan, Mindoro. December 12, 1908. 5 examples. Length, 65 to 120 mm.
9 examples, San Roque, Leyte. July 29, 1909. Length, 83 to 116 mm.
21208. Sianga Bay. May 17, 1908. Length, 100 mm.
1 example, Singaan Island. September 21, 1909. Length, 93 mm.
1 example, Sitanki Reef. September 24, 1909. Length, 90 mm.
14388, 14390, 14411, 14942, 22848, and 22849. Talisse Island. November 9, 1909. Length, 95 to 200 mm. 7 examples.
2 examples, Tanakeke Island. December 21, 1909. Length, 93 to 98 mm.
19214 to 19215. Tapiantana Island. September 13, 1909. Length, 95 to 110 mm.
5 examples, Tara Island. December 14, 1908. Length, 83 to 110 mm.
9 examples, Tara Island. December 15, 1908. Length, 88 to 108 mm.
14670 [217]. Tataan Island, Simulac. February 20, 1908. 2 examples. Length, 95 to 103 mm.
4 examples, Tilig, Lubang Island. July 14, 1908. Length, 97 to 108 mm.
3 examples, Tilig, Lubang. July 15, 1908. Length, 109 to 114 mm.
10005 and 10006. Tomahu Island. December 11, 1909. Length, 96 to 102 mm. [2124.]
51 and 60. Tulnalutan Island. September 9, 1909. Length, 90 to 105 mm.
21508. Ulugan Bay, Palawan Island. December 28, 1908. Length, 98 mm.
14522, 14523, 14526, 14527. Ulugan Bay, Rita Island. December 29, 1908. Length, 78 to 105 mm.
1 example, Uki, Bouro Island, Dutch East Indies. December 9, 1909. Length, 90 mm.
14125. Tifu Bay, Bouro Island. December 10, 1909. Length, 110 mm.
1 example, Basa Reef, Gulf of Boni, Celebes. December 17, 1907. Length, 113 mm.
12913 and 12914. Buka Buka Island, Gulf of Tomini. November 20, 1909. 3 examples. Length, 90 to 104 mm.
1 example. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 94 mm.
14849. Dodepo and Pasejogo Islands, Celebes. November 19, 1909. 2 examples. Length, 98 to 104 mm.
12774 and 12779. Limbe Strait, Celebes. November 10, 1909. Length, 82 to 112 mm.
1 example. Sadaa, Celebes. November 17, 1909. Length, 110 mm.
1 example, Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 17, 1909. Length, 116 mm.
1 example. Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 94 mm.
5 examples, Tidore Island, South of Ternate. November 24, 1909. Length, 73 to 103 mm.
4 examples, Tidore Island. November 25, 1909. Length, 87 to 108 mm.
11171. Nan Wan Bay, South Formosa. January 25, 1910. Length, 85 mm.
56083 U.S.N.M. Bacon. Bureau of Fisheries. Length, 104 mm. 1 example.
56113. U.S.N.M. Bacon. Bureau of Fisheries. Length, 85 mm. 1 example.
33299 A.N.S.P. Bacon, Philippines. Bureau of Fisheries. Length, 99 mm.

ABUDEFDUF THORACOTAENIATUS, new species

Depth 1⅞ to 1$\frac{9}{10}$; head 3⅛ to 3¼, width 1⅗ to 1¾. Snout 3⅙ to 3⅔; eye 2⅓ to 2⅔; maxillary 2⅞ to 3$\frac{1}{10}$, extends slightly beyond

front eye edge, not to pupil; teeth compressed, uniserial, subtruncate; interorbital 2⅓ to 2⅖ in head, broadly convex; suborbital and preopercle edges entire. Gill rakers 6+15, lanceolate.

Tubes in lateral line 12 to 16, sometimes followed by 1 to 6 pores, pores in straight section 8 or 9+1; 3 scales above lateral line to spinous dorsal origin, 7 below, 24 predorsal extending down to nostril; soft vertical fins densely scaled basally. Scales with 7 or 8 basal radiating striæ; apical denticles 121 to 130, with 2 or 3 series of transverse basal elements; circuli very fine.

D. XIII, 13 or 14, thirteenth spine 1⅗ to 2 in head, fifth ray 1 to 2¾ in combined head and body; A. II, 12 or 13, second spine 2 to 2⅛, fifth ray 1 to 1$\frac{1}{10}$; caudal 2⅖ to 2⅔, emarginate; pectoral 2⅘ to 2⅞; ventral 2⅖ to 2⅗; least depth of caudal peduncle 1⅘ to 1⅞ in head.

Deep chocolate brown or sienna. On head and thorax 3 transverse, broad bands of same color leaving intermediate cream white bands, so that third dark band not meeting its fellow or even reaching ventral axil. Pectoral base black. Vertical fins all dark or dusky. Pectoral pale. Ventral whitish, with membranes brownish terminally. Iris slaty.

Known only from the Philippines. A very striking species, not quite like any known in its peculiar color pattern. Altogether as handsome as contrasted, therefore its identification readily assured.

Type.—Cat. No. 89964, U.S.N.M.

19 examples, Biri Channel. June 1, 1909. Length, 48 to 87 mm. Types.
14916 and 14919. Biri Channel. June 2, 1909. 3 examples. Length, 74 to 88 mm. [1574.]
1 example, Doworra Island. December 2, 1909. Length, 88 mm.
13839. Powati Harbor, Makyan Island. November 28, 1909. Length, 95 mm.
5 examples, Talisse Island. November 9, 1909. Length, 73 to 87 mm.
14060 and 14061. Tara Island. December 14, 1908. Length, 80 to 102 mm. [780.]
1 example, Togian Bay, Togian Island. November 19, 1909. Length, 82 mm.
2 examples, Buka Buka Island, Gulf of Tomini, Celebes. November 20, 1909. Length, 90 to 100 mm.
12917. Buka Buka Island. November 20, 1909. Length, 103 mm.
1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 100 mm.

(Θωραξ, breast; ταινια, band; with reference to the color pattern.)

ABUDEFDUF XANTHONOTUS (Bleeker)

Glyphisodon xanthonotus Bleeker, Nat. Tijds. Ned. Indie, vol. 18, 1859, p. 357. Sanlsapura, Bawean.

Glyphidodon xanthonotus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 48 (copied).

Paraglyphidodon xanthonotus Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 3; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 118 (type).

Depth 1⅝; head 3⅕, width 1⅘. Snout 3⅓; eye 2⅖, greater than snout or interorbital; maxillary reaches opposite front eye edge, 3⅕ in head; teeth very slender, simple, conic apically, form even cutting edge, uniserial; interorbital 3, depressed or but slightly convex; preorbital and infraorbital edges entire, free; preopercle edge entire. Gill rakers 8+12, lanceolate, moderate, slender.

Tubes 17 in upper section of lateral line, followed by 2 or 3 irregular pores; pores in straight section 8 to caudal base; 4 scales above lateral line, 10 below, 22 predorsal scales forward to snout tip; cheek with 5 rows of scales, of which uppermost as row from preorbital along infraorbital. Scales with 8 or 9 basal radiating striae; apical denticles 108 to 111, small, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XIII, 13, thirteenth spine 1½ in head, fourth ray 3⅛ in combined head and body; A. II, 13, second spine 1⅖ in head, fifth ray 1⅛; caudal 1⅛, slightly emarginate; least depth of caudal peduncle 2; pectoral 3 in combined head and body; ventral 3.

In alcohol dull brown generally, more or less uniform. Iris brownish. Above and at second and third tubes of lateral line whitish blotch with greatest diameter little more than eye. Anal with anterior half blackish, posteriorly grayish. Ventral with front half blackish, posterior half gray-white.

This species is known only from the type, as reported by Bleeker from Bawean, an example 80 mm. long. We have an example, evidently the same species, described above, but differing a little from the details of color as given by Bleeker. We feel, however, that both the color sketch before us and our specimen may have changed somewhat. In any case, though our example is now largely uniform on the head and rest of the body, the lower fins have the color-pattern of Bleeker's fish. New to the Philippines.

1 example Rasa Island, Mantaquin Bay, Palawan. April 2, 1909. Length, 76 mm. [1493.]

ABUDEFDUF BEHNII (Bleeker)

Glyphisodon behnii BLEEKER, Verh. Batav. Genootsch. (Labr.), vol. 21, 1846–47, p. 25. Batavia, Java.

Paraglyphidodon behnii BLEEKER, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. (6) 405, fig. 7; Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 121 (Batavia).

Glyphidodon behnii GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 48 (Java).

Abudefduf corneyi JORDAN and DICKERSON, Proc. U. S. Nat. Mus., vol. 34, 1908, p. 613, fig. 5. Suva, Fiji.

Abudefduf coracinus SEALE, Philippine Journ. Sci., vol. 4 (6) 1909, p. 520, pl. 13. Sitanki Island, Jolo Archipelago.

Depth 2⅛; head 3¼. Snout 3⅔ from snout tip; eye 3⅞, 1⅛ in snout; maxillary apparently not quite to eye, 3⅞ in head from snout tip; interorbital little elevated. Tubes 18 in upper section of

lateral line, 12 pores in straight section to caudal base; 4 scales above lateral line, 10 below, 23 predorsal little forward of nostril. Infraorbital scales biserial; preorbital also scaly; 3 rows of cheek scales below infraorbital.

D. XIII, 15, 1, thirteenth spine 1⅞ in total head length, sixth ray 1$\frac{1}{10}$; A. II, 14, 1, second spine 1½, sixth ray 1¼; caudal emarginate, 1; least depth of caudal peduncle 2$\frac{1}{10}$; pectoral 1; ventral 2⅞ in combined head and body. Body uniform deep brownish. Iris with yellow circle around pupil. Fins brown, pectoral yellowish with dusky black blotch at origin about size of pupil. (Bleeker.)

East Indian region. *Abudefduf coracinus* Seale appears to be a synonym. Bleeker's examples were 106 to 113.

ABUDEFDUF MELAS (Cuvier)

Glyphisodon melas (Kuhl and Van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 472. Java.—Schlegel and Müller, Nat. Gesell. Nederl. Zool., vol. 2, 1839–1844, p. 23, pl. 5, fig. 2 (Java, Manado, Amboina).

Glyphidodon melas Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 45 (Ceram, Aneiteum).—Günther, Fishes of Zanzibar, 1866, p. 83 (Aden, Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 526 (Red Sea).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 440 (Batjan).

Paraglyphidodon melas Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 4; Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 123 (Nias, Singapore, Java, Celebes, Solor, Ceram, Amboina).—Day, Fishes of India, Suppl., 1888, p. 801; Fauna British India, vol. 2, 1889, p. 388.

Abudefduf melas Beaufort, Bijd. Dierk. Amsterdam, vol. 19, 1913, p. 128 (Saonek).

Glyphisodon ater (Ehrenberg) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 473. Massuah, Red Sea.

Glyphisodon violaceus Brevoort, Narr. Exp. Jap., vol. 2, 1856, p. 264. Riu Kiu Islands.

Abudefduf rhomaleus Snyder, Proc. U. S. Nat. Mus., vol. 40, 1911, p. 534. Naha, Okinawa; also, vol. 42, 1912, p. 505, pl. 65, fig. 1.

Depth 1⅘ to 1⅞; head 3⅕ to 3⅓, width 1½ to 1⅞. Snout 3 to 3⅓; eye 3 to 4, 1⅙ in snout or greater than snout in young, 1 to 1½ in interorbital; maxillary reaches halfway to eye, to eye in young, 3⅖ to 3¾ in head; interorbital 2⅗ to 2⅘, broadly convex. Gill rakers 6+14, lanceolate, rather long.

Tubes in lateral line 16 or 17, pores in straight section 8 to 10 + 2 to 4; 3 scales above lateral line to spinous dorsal origin, 10 or 11 below, 23 predorsal; 4 rows of cheek scales, of which uppermost row on infraorbitals. Scales with 9 or 10 basal radiating striae; apical denticles 108 to 206, with 2 or 3 transverse series of basal elements; circuli very fine.

D. XIII, 14, 1, thirteenth spine 1½ to 1⅘ in head, fifth ray 1⅛ to 1⅕; A. II, 13, 1, second spine 1⅗ to 1⅘, fifth ray 1$\frac{1}{10}$ to 1⅓; least depth of caudal peduncle 1⅘ to 1$\frac{2}{10}$; caudal usually little

obliquely emarginate, upper lobe slightly longer, 3⅕ to 3⅓ in combined head and body; pectoral 3 to 3⅖; ventral 2⅞ to 3¼.

Uniform blackish or dusky black. Iris dusky, with deep brown ring around pupil.

Widely distributed from the Red Sea and Zanzibar to the East Indies, Riu Kiu Islands, and Hawaii. Easily distinguished by its uniform blackish color. Bleeker's figure differs only in the warm brown color and even the pale ring around the pupil is quite bright. In the freshly dead fish this is yellow and usually quite conspicuous as the fish are heaped up in market stalls. Bleeker describes the color as deep olivaceous or blackish-brown and the iris brown or purple, the pupil commonly margined with golden.

1 example, Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length 90 mm.
14774. Bagacay Bay, Escarpada Island. March 13, 1909. Length, 168 mm.
10326. Balikias Bay, Lubang Island. July 17, 1908. Length, 134 mm.
11158. Basut River, Luzon, in fresh water. June 15, 1909. Length, 148 mm.
4 examples, Biri Channel. June 1, 1909. Length, 113 to 148 mm.
9933. Biri Channel. June 2, 1909. 2 examples. Length, 95 to 127 mm.
1 example, Buang Bay, Talajit Island. March 15, 1909. Length, 145 mm.
11629 and 11630. Bugsuk Island, Balabac. January 5, 1909. Length, 155 to 165 mm.
17855. Bumbum Island. September 25, 1909. Length, 139 mm.
2 examples, Butauanan Island. June 13, 1909. Length, 105 to 118 mm.
5418 to 5427, 5429 to 5439. Candaraman Island, Balabac. January 4, 1909. Length, 85 to 130 mm.
2 examples, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 97 to 140 mm.
1 example, Capunuypugan, Mindanao. May 9, 1908. Length, 118 mm.
2 examples, Capunuypugan, Mindanao. May 10, 1908. Length, 104 to 132 mm.
9 examples, Casogoran, Malhon Island. July 27, 1909. Length, 100 to 138 mm.
1 example, Cataingan Bay, Masbate. April 18, 1908. Length, 118 mm.
5932. Catbalogan, Samar. April 15, 1908. Length, 142 mm.
12571. Caxisigan Island. January 2, 1909. 3 examples. Length, 140 mm.
1 example, Daisy Island, west of Bumbum. January 6, 1910. Length, 145 mm.
1 example, Dalaganem Island. April 8, 1909. Length, 98 mm.
1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 113 mm.
10419. East Side Verde Island. July 22, 1908. Length, 160 mm.
3 examples, Galera Bay, Mindoro. June 9, 1908. Length, 123 to 162 mm.
4682, 14379, and 14380. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 126 to 160 mm.
13061. Gomomo Island. December 3, 1909. Length, 137 mm.
1 example Guntao Island. December 20, 1908. Length, 140 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 140 mm.
2 examples, Kapoposang Island. December 28, 1909. Length, 130 to 135 mm.
1 example, Labuan Blanda Island. December 14, 1909. Length, 134 mm.
13925. Lampinigan Island. September 11, 1909. Length, 165 mm.
151, 195, 17840. Langao Point, Luzon. June 24, 1909. Length, 118 to 155 mm.
1 example, Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 98 mm.
7918. Limbones Cove. February 8, 1909. Length 143 mm.
20913 and 20916. Little Santa Cruz. May 26, 1908. Length, 134 to 150 mm.
1 example, Little Santa Cruz Bay. May 28, 1908. Length, 140 mm.

2 examples, Little Santa Cruz Island. May 28, 1908. Length, 124 to 143 mm.
14692. Maculabo Island. June 13, 1909. Length, 118 mm.
1 example, Maculabo Island. June 14, 1909. Length, 77 mm.
14334. Maitara Island. November 26, 1909. Length, 160 mm.
19289 and 19290. Malapascua Island. March 16, 1909. Length, 140 to 150 mm.
11374 and 11376. Maricaban Island. January 20, 1908. Length, 38 to 144 mm.
14697 and 14698. Matnog Bay. May 31, 1909. Length, 143 to 158 mm.
11345. Mompog Island. March 3, 1909. Length, 144 mm.
1 example. Murcielagos Bay. August 21, 1909. Length, 130 mm.
4682. Nasugbu Bay. January 16, 1908. Length, 160 mm.
14285 and 14286. Pagapas Bay. February 20, 1909. Length, 110 to 165 mm.
11311. Palag Bay, Luzon. June 16, 1909. Length, 130 mm.
11413. Paluan Bay, Mindoro. December 11, 1908. Length, 130 mm.
14361 and 14362, 21024. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 112 to 133 mm.
1 example, Pasacao, Ragay Gulf. March 9, 1909. Length, 138 mm.
20919. Philippines. 5 examples. Length, 116 to 146 mm.
12930. Pilas Island. September 12, 1909. Length, 167 mm.
11058, 13822. Port Jamelo, Luzon. July 13, 1908. Length, 153 to 158 mm.
10474 and 14744. Port Maricaban. July 21, 1908. Length, 153 to 160 mm.
6738. Port Matalvi, Luzon. November 22, 1908. 3 examples. Length, 95 to 155 mm.
2 examples, Port Matalvi. November 23, 1908. Length, 138 to 140 mm.
14587. Port Palapag. June 3, 1909. Length, 95 to 143 mm.
21414. Quinalasag Island, Masamat Bay. June 12, 1909. 3 examples. Length, 90 to 148 mm.
2 examples. Rapu Rapu Island. June 22, 1909. Length, 97 to 120 mm.
19237. Rasa Island, Palawan. April 1, 1909. Length, 148 mm.
1 example. Sacol Island. September 9, 1909. Length, 103 mm.
11313. San Roque, Leyte Island. July 29, 1909. Length, 136 mm.
19532. Singaan Island. September 21, 1909. Length, 122 mm.
1 example. Sulade Island. September 17, 1909. Length, 172 mm.
1 example, Taganak Island. January 1, 1909. Length, 133 mm.
1 example, Talisse Island. November 9, 1909. Length, 103 mm.
20713. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 123 mm.
4 examples, Tara Island. December 14, 1908. Length, 110 to 130 mm.
19147. Tilig, Lubang. July 14, 1908. Length, 152 mm.
10383. Tilig. July 15, 1908. 2 examples. Length, 140 to 147 mm.
1 example, Tulnalutan Island. September 9, 1909. Length, 143 mm.
3 examples, Tumindao Island, reefs of southern lagoon. February 26, 1908. Length, 93 to 129 mm. [295 to 297.] Indigo black throughout.
7918, 19059, 19060. Tutu Bay, Jolo Island. September 19, 1909. Length, 147 to 170 mm.
A1301. Uki, Bouro Island. December 9, 1909. Length, 175 mm.
14329 and 14330. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 148 mm.
13301. Dodepo and Pasejogo Islands, Celebes. November 16, 1909. Length, 155 mm.
13661. Limbe Strait, Celebes. November 16, 1909. Length, 160 mm.
13657. Sadaa Island, Celebes. November 17, 1909. Length, 107 mm.
14646. Tidore Island, south of Ternate. November 24, 1909. 2 examples. Length, 133 to 137 mm.
1 example, Tidore Island. November 25, 1909. Length, 127 mm.
68233 U.S.N.M. Naha, Okinawa, Riu Kiu. Length, 167 mm. Type of *Abudefduf rhomaleus*.

ABUDEFDUF OXYODON (Bleeker)

Glyphisodon oxyodon Bleeker, Act. Soc. Ind. Néerl. (Celebes), vol. 3, 1857–8, p. 14. Manado.

Glyphidodon oxyodon Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 44 (Celebes).

Paraglyphidodon oxyodon Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 404 (5), fig. 2; Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 127 (Bawean and Celebes).

Depth 1⅞; head 3, width 2. Snout 3⅓; eye 2⅞; maxillary extends slightly beyond front eye edge, not quite to pupil, 3$\frac{1}{10}$ in head; teeth uniserial, compressed, pointed; interorbital 3¼, broad and slightly convex; suborbital and preopercle edges entire. Gill rakers 8+14, lanceolate.

Tubes in lateral line 14, followed by 3 pores; pores in straight section of lateral line 8+1; 4 scales above lateral line to spinous dorsal origin, 7 below; 20 predorsal, extending well down on snout; fins densely scaly basally. Scales with 6 to 8 basal radiating striæ, edge scalloped; apical denticles 93 to 95, very fine, with 1 to 3 transverse series of basal elements; circuli very fine.

D. XII, 14, twelfth spine 1⅞ in head, seventh ray 1⅓; A. II, 13, second spine 1⅞, sixth ray 1¼; caudal 1$\frac{1}{10}$, slightly emarginate behind; least depth of caudal peduncle 2; pectoral 1$\frac{1}{10}$; ventral 2⅖ in combined head and body.

Deep chocolate brown generally, all fins largely dusky to blackish. Light blue band extends from snout tip, including upper rim of eye and then back above suprascapular and close along and above tubular lateral line, for 3 scales of its course. On lower side of head another light blue band from end of maxillary back to lower part of opercle. Also blue spot on interopercle and smaller one on subopercle. From thirteenth tube of lateral line oblique short blue band to origin of soft dorsal.

Known to Bleeker from 2 examples, 46 and 77 mm., obtained at Java and Celebes. We have a single example, from Cuyo, Cuyo Island, obtained April 9, 1909, 65 mm. long [1512]. It differs from Bleeker's figure in that the third or lowest lateral blue band is only represented on the anterior surface of the upper edge of the caudal peduncle by a few blue scales, these little or not visible as the fish is viewed in profile.

Blue-black all over, posterior margins of soft vertical fins rich purple. Bright purple spot in dorsal axil on fin. A similarly colored stripe from base of first soft dorsal membrane curves down and forward to lateral line. Stripe of bright purple or blue from in front of upper eye (not meeting?), through upper eye backward above lateral line till opposite second dorsal spine. Similar stripe from corner of mouth to front of opercle. Ventral darkened with blue. Blue markings very conspicuous in life, not very distinct after death. Only 2 seen.

ABUDEFDUF BLEEKERI, new name

Glyphidodontops cyaneus (not QUOY and GAIMARD) BLEEKER, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 409 (10), fig. 2; Nat. Verh. Holl. Maatsch. Wet. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 130 (Timor).

Depth 2¼ to 2⅓; head 3⅛ to 3⅓, width 1⅔ to 1¾. Snout 4 to 4⅖; eye 2⅖ to 3, 1 in interorbital or little greater in young; maxillary reaches eye, 3¼ to 3⅖ in head; interorbital 3¼, convex. Gill rakers 6+15, lanceolate, long as gill filaments.

Tubes in lateral line 15 or 16, pores in straight section 7 to 9+1 or 2; 3 or 4 scales above lateral line to spinous dorsal origin, 9 or 10 below, 8 to 14 predorsal. Scales with 7 to 10 basal radiating striae; apical denticles 73 to 113, with 1 to 3 transverse series of basal elements; circuli fine.

D. XIII, 13 or 14, thirteenth spine 1¾ to 1$\frac{9}{10}$ in head, eighth ray 1⅓ to 1⅖; A. II, 12, 1 or 13, 1, second spine 2¼ to 2⅓, eighth ray 1⅓ to 2; least depth of caudal peduncle 2 to 2⅛; pectoral 1; ventral 1⅕; caudal 2⅘ to 3⅛ in combined head and body, forked.

Pale gray brown. Body everywhere, except fins, spotted and blotched with gray blue. Spots large on cheek and opercle, fine and crowded on head above. On vertical fins base of each scale with small blue spot or dot. Fins all pale or light brownish. Anal with 2 submarginal grayish parallel lines below. Pectoral with small inconspicuous dusky spot, much less than pupil, at fin origin. Iris pale yellowish.

Known only from Timor and the Philippines. Differs from *Abudefduf cyaneus*, with which Bleeker apparently confused it, in the pale general color of preserved materials in alcohol. It has, however, in contrast a forked caudal, a dark spot at the pectoral origin and a pale submarginal band on the anal fin. Bleeker shows the infraorbitals scaly, which is not the case in our specimens. The dark pectoral spot it shares with *Abudefduf hemicyaneus* Weber,[9] but that species is blue above with the under surface of the body, ventral, anal, caudal peduncle and caudal pale or whitish.

2068. Jolo. February 14, 1908. Length, 42 mm.
22913. Jolo. February 16, 1908. Length, 71 mm.
5 examples, D. 5145. Jolo Light, Philippines. February 15, 1908. Length, 60 to 78 mm. Type.
1 example Pangasinan Island. February 13, 1908. Length, 58 mm.
1 example, D. 5159. Tinakta Light, Philippines. February 21, 1908. Length, 41 mm.

(For Dr. Pieter Bleeker, author of the most elaborate "mémoire sur les Chromides marins ou Pomacentroides de l'inde Archipélagique.")

[9] Siboga Exp., vol. 57, Fische, 1913, p. 351, pl. 10, fig. 1. Tual, Kei.

ABUDEFDUF BIOCELLATUS (Quoy and Gaimard)

Glyphisodon biocellatus Quoy and Gaimard, Voy. Uranie Zool., January 29–May 26, 1825, p. 389. Guam.—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 482 (Java, Guam, Strong Island, New Hebrides).—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 24, pl. 6, fig. 4 (Java).

Glyphidodon antjerius var. *biocellatus* Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 528 (Koseir, Red Sea).

Chaetodon brownriggii Bennett, Fishes of Ceylon, 1828, pl. 8. Ceylon.

Glyphisodon brownriggii Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 484 (copied).

Glyphidodon brownriggii Kner, Reise Novara, Fische, pt. 2, 1865, p. 244 (Nicobars).—Waite, Proc. Linn. Soc. New South Wales, ser. 2, vol. 9, 1894, p. 219 (Maroubra, Port Jackson, Lord Howe Island).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 441 (Ternate); Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 144 (Bal Hâf, Socotra).

Abudefduf brownriggii Beaufort, Bijd. Dierk., Amsterdam, vol. 19, 1913, p. 128 (Saonek).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 352 (Sanguisiapo in Sulu Archipelago, Lombok, Savu, Sawan, Karkaralong Island, Beo, Salibabu, Sula-Besi, Ambon, Nusa Laut, Tiur, Roma Island, Timor).

Abudefduf brownriggii Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 264 (Ticao Island).

Glyphisodon antjerius (Kuhl and Van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 481. Anjer, Java.

Glyphisodon andjerinus Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–1844, p. 24, pl. 6, fig. 3 (Anjer).

Glyphidodon antjerius Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 50 (Amboina, Borneo).—Kner, Reise Novara, Fische, pt. 2, 1865, p. 244 (Shanghai, Sambelong).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 527 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 387, pl. 81, figs. 4–5 (Andamans).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 233, pl. 127, fig. B (Samoa, Ponape).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Ceylon).—Meyer, An. Soc. Espan. Hist. Nat., vol. 14, 1885, p. 34 (Cebu, Sangi, Mysore).—Day, Fishes of India, Suppl. 1888, p. 801; Fauna Brit. India, vol. 2, 1889, p. 390.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Cebu).

Glyphidodon anjerius Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 271 (Lauang, Samar).

Glyphidodontops antjerius Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 2; Nat. Verh. Holl. Maatsch. Harlem (No. 16), ser. 3, vol. 2, 1877, p. 134 (Sumatra, Batu, Cocos, Java, Celebes, Sangi, Solor, Timor, Buru, Amboina, Ceram, Goram, Aru, Waigiu, New Guinea, Philippines).

Abudefduf antjerius Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905, p. 287, pl. 42, fig. 2 (Apia).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 264 (Ticao Island and Calayan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Tanegashima).

Glyphisodon punctulatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 484. Guam.

Glyphisodon balinensis Bleeker, Verh. Bat. Genoot. (Bali), vol. 22, 1849, p. 9. Boleling, Bali.

Glyphisodon rossii BLEEKER, Nat. Tijds. Ned. Indie, vol. 7, 1854, p. 48. Nova Selma, Cocos Island.

Glyphidodon antjerius var. *fasciatus* GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 51. Amboyna and Borneo.

Glyphidodon hemimelas KNER, Sitz. Akad. Wiss. Wien, vol. 58 (1), 1868, pp. 30, 350, pl. 8, fig. 25. Kandavu, Fiji.

Glyphidodon antjerius var. *unimaculatus* KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 527. Kosier, Red Sea.

Depth 2⅛ to 2⅙; head 3 to 3⅕, width 1¾ to 1⅘. Snout 3¼ to to 3⅓; eye 2⅘ to 3; maxillary reaches eye, 3 to 3⅛ in head; teeth uniserial incisors, end of each slightly notched; interorbital 3 to 3¼, broadly convex; suborbital and preopercle edges entire. Gill rakers 4 + 12, lanceolate.

Tubes in lateral line 16 or 17, pores in straight section 7 to 9; 3 scales above lateral line to spinous dorsal origin, 8 below, 16 predorsal extending forward to nostril; rayed vertical fins densely scaled basally. Scales with 8 or 9 basal radiating striae, edge scalloped; apical denticles 89 to 90, with 2 or 3 series of basal elements transversely; circuli very fine.

D. XII or XIII, 13 to 15, twelfth spine 1⅔ to 1⅘ in head, eighth ray 1¼ to 1⅓; A. II, 12 to 14, second spine 1⅘ to 1⅞, sixth ray 1¼ to 1⅖; least depth of caudal peduncle 2 to 2⅕; pectoral $1\frac{1}{10}$ to 1⅛; ventral 1; caudal 3 to 3⅕ in combined head and body, emarginate.

Brown, paler below, each scale with 1 or 2 pearly to azure blue spots. A band of azure blue, sometimes variably waved or expanded, or again incomplete posteriorly, extends to black ocellus at front of soft dorsal or variably on last dorsal spines. Also a second and usually smaller black ocellus at bases of last dorsal rays. Blue band along side of snout, another parallel along suborbitals and third band across chin and cheeks, last often as row of spots besides rather large scattered blue spots on rest of head. Iris with some blue spots or bars. Fins all brown, caudal and pectoral often yellowish and lower edge of anal dusky. Caudal largely dusky.

Widely distributed in the Indo-Pacific, from the Red Sea and East Africa to the East Indies, tropical Australia, and Oceania. The blue band along the back is a conspicuous marking in this species, usually embracing the interdorsal ocellus. We have no examples showing it extending to two black blotches on the posterior dorsal rays, as shown in Bleeker's figure. In none of our examples is the interdorsal ocellus absent. Often the blue band may be reduced to a narrow inconspicuous line, of variable extent, along the base of the spinous dorsal. Frequently its posterior continuation is simply a row of blue spots.

27 examples, Batan Island. June 5, 1909. Length, 17 to 48 mm.
24 examples, Batan Island. July 22, 1900. Length, 14 to 43 mm.
1 example, Bugsuk Island, Balabac. January 5, 1909. Length, 27 mm.
1 example, Canimo Island, near Daet. June 5, 1909. Length, 36 mm.
1 example, Cebu, reef opposite. April 7, 1908. Length, 37 mm.
1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 45 mm.
1 example, Great Tobea Island. December 15, 1909. Length, 22 mm.
22 examples, Gubat Bay, Luzon. June 23, 1909. Length, 17 to 40 mm.
16 examples, Maculabo Island. June 14, 1909. Length, 20 to 48 mm.
8 examples, Pilas Island. September 12, 1909. Length, 18 to 35 mm.
1 example, Port Palapag. June 3, 1909. Length, 38 mm.
19 examples, Sablayan Island, Mindoro. December 13, 1908. Length, 26 to 48 mm. [763, 765 to 767.]
1 example, San Pascual. March 8, 1909. Length, 20 mm.
4 examples, Silino Island. August 10, 1909. Length, 19 to 29 mm.
2 examples, Simaluc Island, Bisibisi. September 22, 1909. Length, 23 to 39 mm.
2 examples, Simaluc Island. September 23, 1909. Length, 42 to 43 mm.
1 example, Tara Island. December 15, 1909. Length, 38 mm.
3 examples, Tobea Island. December 15, 1909. Length, 18 to 49 mm.
20 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 19 to 52 mm.
15117 U.S.N.M. Samoa. Steinberger. 4 examples. Length, 38 to 42 mm.
52281 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 11 examples. Length, 24 to 48 mm.
56190 U.S.N.M. Luzon, Philippines. Philippine Commission. 1 example. Length, 41 mm.
57946 U.S.N.M. Zamboanga. Maj. E. A. Mearns. 1 example. Length, 22 mm.
65706 U.S.N.M. Arhno Atoll. *Albatross* Collection. 1 example. Length, 43 mm.
65707 U.S.N.M. Makemo, Paumotus. *Albatross* Collection. 50 examples. Length, 34 to 93 mm.
70744 U.S.N.M. Tanegashima, Japan. *Albatross* Collection. 8 examples. Length, 27 to 49 mm.
72204 U.S.N.M. Ticao Island, Philippines. R. C. McGregor. 2 very young examples.
72205 U.S.N.M. Ticao Island. R. C. McGregor. 1 young. Length, 18 mm.
31341 to 31344, 51155 A.N.S.P. Apia, Samoa. Bureau of Fisheries. Length, 35 to 50 mm.

ABUDEFDUF CYANEUS (Quoy and Gaimard)

Glyphisodon cyaneus Quoy and Gaimard, Voy. Uranie, Zool., Jan. 20–May 26, 1825, p. 392, pl. 64, fig. 3. No locality.

Abudefduf cyaneus Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 92 (Bacon).

Glyphisodon azureus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 479 (on Quoy and Gaimard; Timor and Friendly Islands).

Glyphidodon azureus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 53 (copied).

Abudefduf taupou Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 288, pl. 43, fig. 3. Apia and Pago Pago.

Abudefduf turchesius Jordan and Seale, Bull. Bur. Fisher, vol. 26, 1906 (1907), p. 28, fig. 10. Cavite.— Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 505 (Okinawa).

Depth 2⅕ to 2⅓; head 3 to 3⅓, width 1¾ to 1⅘. Snout 4 to 4¼; eye 2¾ to 3, greater than snout or interorbital; maxillary extends little beyond front of eye though not to pupil, 2⅞ to 3⅖ in head; interorbital 3⅖ to 3¾, broadly convex. Gill rakers 6+10, lanceolate, rather long and slender.

Tubes in lateral line 16 or 17, pores in straight section 7 or 8+2; 3 scales above lateral line to spinous dorsal origin, 9 below, 9 predorsal; 2 rows of cheek scales, none on infraorbitals. Scales with 8 to 10 basal radiating striae; apical denticles 64 to 92, with 2 series of basal elements; circuli very fine.

D. XIII, 12, 1, thirteenth spine 1¾ to 1⅞ in head, sixth ray 1⅙ to 1⅕; A. II, 13, 1, second spine 2 to 2⅛, eighth ray 1⅙ to 1⅕; caudal 1, rounded, or very slightly emarginate as expanded; least depth of caudal peduncle 2; pectoral $1\frac{1}{10}$ to 1⅛; ventral $3\frac{1}{10}$ to 3⅙ in combined head and body.

Deep gray blue generally, but little paler on belly. Each scale with narrow light blue basal spot. On head blue blotch before eye and blue band along infraorbital. Cheeks, opercles and top of head with rather large blue spots. Iris dusky and gray blue. Dorsals gray blue basally, terminally dusky, also caudal and anal. Pectoral dull brown, without basal spot. Ventral membranes gray, rays brownish. Some small examples show dark neutral dusky borders to soft vertical fins.

East Indies, Philippines, Riu Kiu, Oceania. Quoy and Gaimard's figure is blue, fins all yellow, also band from mouth to eye and suborbitals.

14508. Biri Channel. June 2, 1909. Length, 58 mm.
1 example, Cebu market. August 28, 1909. Length, 60 mm. [1850].
2 examples, Grande Island Reef. January 8, 1908. Length, 48 to 50 mm.
51714 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 5 examples. Types of *Abudefduf taupou.*
56262 U.S.N.M. Bacon. Philippine Commission. 2 examples. Length, 45 to 57 mm.
71708 U.S.N.M. Okinawa at Nafa. *Albatross* Collection. 9 examples, largest 62 mm. As *Abudefduf turchesius* by Snyder.

ABUDEFDUF GLAUCUS (Cuvier)

Glyphisodon glaucus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 475. Guam.
Abudefduf glaucus Evermann and Seale, Bull. Bur. Fisher, vol. 26, 1906 (1907), p. 93 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 264 (Cagayancillo and Ticao).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Misaki and Tanegashima, Japan), p. 505 (Okinawa).
Glyphidodon modestus Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–1844, p. 23, pl. 6, fig. 2. Java Sea, north Java, south Borneo, west Sumatra.—Günther, Cat. Fish. Brit. Mus., 1, 1862, p. 55 (Java).—Kner, Reise Novara, Fische, pt. 2, 1865, p. 246 (Nicobars).—Day, Fishes of India, pt. 3, 1877, p. 388, pl. 81, fig. 6 (Andamans); Fauna British India, vol. 2, 1889, p. 391.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 548 (Luzon, Manila, Navotas).

Glyphidodontops modesta Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 403 (4), fig. 9; Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 131 (Sumatra, Nias, Java, Bali, Borneo, Buru, Amboina).

Abudefduf modestus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 350 (Lucipara Reef).

Glyphisodon phaiosoma Bleeker, Verh. Batav. Genoot. (Bali), vol. 22, 1849, p. 9. Boleling, Bali.

Gliphidodon pallidus De Vis, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 452. Bank's Group.

Abudefduf caesio Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 53, fig. 8. Tubuai, Austral Island.

Abudefduf unimaculatus (not Cuvier) Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Cagayancillo example).

Abudefduf zonatus (not Cuvier) Fowler and Silvester, Pub. No. 312 Carnegie Inst. Wash., 1922, p. 120 (Pago Pago).

Depth 2⅓ to 2½; head 2⅘ to 3⅖, width 1⅔ to 2. Snout 3½ to 4⅞; eye 2¼ to 3⅛, greater than snout or interorbital; maxillary reaches little beyond front eye edge, to front pupil edge in young, 2¾ to 3⅛ in head; teeth compressed, uniserial or occasionally irregularly biserial, ends truncate or seldom slightly notched medianly; interorbital 3 to 3⅔ in head, evenly convex. Gill rakers 7+13, lanceolate, rather long.

Tubes in lateral line 17 to 20, followed by 2 or 3 irregular pores; pores in straight section 6 to 8 to caudal base; 2 or 3 scales above lateral line, 8 or 9 below, 14 to 16 (abnormally 6) predorsal forward opposite front of eyes; preorbital, infraorbitals and preopercle flange naked, 3 or 4 rows of scales on cheek. Scales with 7 to 11 basal radiating striae; apical denticles 58 to 118, with 2 to 4 transverse series of basal elements; circuli very fine.

D. XIII, 12, 1, thirteenth spine 1⅞ to 2 in head, sixth ray 1 to 1⅛; A. II, 12, 1, second spine 2 to 2⅕, sixth ray 1⅛ to 1⅙; caudal 1, emarginated little behind; least depth of caudal peduncle 1⅞ to 2; pectoral 1⅛ to 1⅕; ventral 1 to 1⅛, sometimes little greater than head.

Back mouse gray, with drab-gray laterally and under surfaces light olive buff to creamy. Vertical fins like back. Paired fins paler. Iris neutral brown.

India, East Indies, Philippines, Japan, Melanesia, Micronesia, Polynesia. Though pale and largely dull colored, many examples show narrow sky-blue line from above nostrils back and up toward origin of spinous dorsal. Sometimes narrow light blue bar on pr[illegible] orbital, another along lower eye edge on infraorbitals, and 4 or 5 blu[illegible] bars may radiate from posterior eye edge. Often minute sky bl[illegible] spots on upper side of head and along dorsal fins basally.

17 examples, Batan, Rapurapu, Strait. June 5, 1909. Length, [illegible] mm.

[1602.] Very pale gray, paler below without distinct markings of any kind. 16 examples, Batan Island. July 22, 1909. Length, 17 to 59 mm.

1 example, Cataingan Bay, Masbate. April 18, 1908. Length, 50 mm
28 examples, Gubat Bay, Luzon. June 23, 1909. Length, 22 to 86 mm.
1 example, Mansalay Island, Mindoro. June 4, 1908. Length, 37 mm.
7 examples, Nogas Point, Panay. February 4, 1908. Length, 25 to 73 mm.
22430. Philippines. Length, 40 mm.
1 example, Port Caltom. December 15, 1908. Length, 50 mm.
3 examples, Sablayan, Mindoro. December 13, 1908. Length, 60 to 74 mm.
1 example, Simaluc Island. September 22, 1909. Length, 63 mm.
1 example, Sitanki Reef. September 24, 1909. Length, 48 mm.
1 example, Tomahu Island. December 11, 1909. Length, 60 mm.
5 examples, Nan Wan, Formosa. January 27, 1910. Length, 33 to 43 mm.
52474 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 20 examples. Length, 43 to 78 mm.
65397 U.S.N.M. Mangareva, Gambier Islands. *Albatross* Collection. 2 examples. Length, 51 to 64 mm.
65708 U.S.N.M. Makatea, Paumotus. *Albatross* Collection. 2 examples. Length, 25 to 37 mm.
65709 U.S.N.M. Fakarava. *Albatross* Collection. 1 example. Length, 60 mm.
70749 U.S.N.M. Tanegashima, Japan. *Albatross* Collection. 15 examples. Length, 30 to 63 mm.
70749 U.S.N.M. Misaki, Sagami. *Albatross* Collection. 1 example. Length, 37 mm.
71670 U.S.N.M. Nafa, Okinawa. *Albatross* Collection. 25 examples. Length, 43 to 90 mm.
72187 U.S.N.M. Cagayancillo. R. C. McGregor. 1 example. Length, 73 mm. Reported as *Abudefduf unimaculatus* by Jordan and Richardson.
72206 U.S.N.M. Cagayancillo. R. C. McGregor. 1 example. Length, 82 mm.
31213 to 31251 A.N.S.P. Apia, Samoa. Bureau of Fisheries. Length, 35 to 78 mm.
51131 to 51154, 51156 to 51158 A.N.S.P. Pago Pago, Samoa. Capt. C. F. Silvester. Length, 16 to 67 mm.
51114 to 51130 A.N.S.P. Pago Pago. Capt. C. F. Silvester. Length, 22 to 68 mm. As *Abudefduf zonatus*.

ABUDEFDUF LEUCOGASTER (Bleeker)

Glyphisodon leucogaster Bleeker, Verh. Batav. Genoot. (Labr.), vol. 21, 1846–1847, p. 26. Java.

Glyphidodon leucogaster Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 46 (Amboyna).—Günther, Fishes of Zanzibar, vol. 2, 1866, p. 83 (Zanzibar).—Klunzinger, Verh. zool. bot. Gesell. Wien, vol. 21, 1871, p. 523 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 388, pl. 81, fig. 3.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (North Celebes).—Day, Fauna British India, vol. 2, 1889, p. 390.

Glyphidodon (*Amblyglyphidodon*) *leucogaster* Bleeker, Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 108 (Java, Duizend Islands, Timor, Buru, Ceram, Amboina, Banda).

Abudefduf leucogaster Weber, Siboga Exp., vol. 57, Fische, 1913, p. 348 (Amboina and Banda).

Glyphidodontops unimaculatus (not Cuvier) Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 6.

Depth 1⅔ to 1¾; head 3 to 3½, width 1⅔ to 1¾. Snout 3 to 3¾; eye 2¾ to 3¼, greater than snout, 1 to 1⅛ in interorbital; maxillary nearly or to front eye edge, 3⅕ to 3½ in head; teeth compressed, uniserial, truncate; interorbital 2⅗ to 2⅔, little convex. Gill rakers 8 or 9+18, lanceolate, rather short.

Tubes in lateral line 16, pores in straight section 8 or 9+1; 3 or 4 scales above lateral line, 9 or 10 below, 20 to 22 predorsal forward to snout end; 5 rows of cheek scales, of which 1 row on infronorbitals. Scales with 7 basal radiating striae; 113 to 127 apical denticles, with 2 to 4 transverse series of basal elements; circuli very fine.

D. XIII, 11 to 13, fifth spine 1⅗ to 1⅘ in head, second ray 2½ to 3⅔ in combined head and body; A. II, 12 to 14, second spine 1⅕ to 1¼ in head, fifth ray 3⅔ to 3⅘ in combined head and body; least depth of caudal peduncle 2 in head; caudal 2⅓ to 2¾ in combined head and body, forked; pectoral 2⅓ to 3; ventral 2⅖ to 2⅔.

Gray brown above, whitish, with more or less silvery below. Scales on back and side with dark edges. Iris pale yellowish and slaty. Vertical fin bases slightly tinged greenish yellow and greater rayed portions pale gray. Spinous dorsal and upper soft dorsal edges dusky. Anal broadly dusky on front lower portion, including lower edge of rayed fin. Upper and lower caudal edges dusky. Pectoral pale greenish yellow, with small dark spot at origin. Ventrals mostly whitish, ends of rays grayish.

Red Sea, Zanzibar, India, East Indies.

1 example, Batan Island. June 5, 1909. Length, 113 mm.
4 examples, Biri Channel. June 1, 1909. Length, 100 to 123 mm.
1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 93 mm.
2 examples, Buang Bay, Talajit Island. March 15, 1909. Length, 97 to 115 mm.
174, 175, 178. Busin Harbor, Burias Island. March 8, 1909. Length, 80 to 107 mm.
1 example, Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 118 mm.
2 examples, Capunuypugan, Mindanao. May 9, 1908. Length, 88 to 99 mm.
5 examples, Caracaran, Batan Island. June 8, 1909. Length, 28 to 90 mm.
4 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 71 to 122 mm.
13228. Doworra Island. 6 examples. December 2, 1909. Length, 53 to 122 mm.
2 examples, Galera Bay, Mindoro. June 9, 1908. Length, 117 to 118 mm.
1 example, Inamucan Bay, Mindanao. August 9, 1909. Length, 115 mm.
4 examples, Labuan Blanda Island. December 14, 1909. Length, 93 to 100 mm.
1 example, Ligpo Point, Balayan Bay. Luzon. January 18, 1908. Length, 95 mm.
1 example, Mactan Island, Cebu. March 25, 1909. Length, 112 mm.
19288. Malapascua Island. March 16, 1909. Length, 127 mm.
14932. Mansalay, Mindoro. June 4, 1908. 3 examples. Length, 105 to 107 mm.
1 example, Mantacao Island, Bohol. April 8, 1908. Length, 94 mm.
1 example, Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 90 mm.
1 example, Murcielagos Bay. August 9, 1909. Length, 117 mm.
1 example, Northwest Verde Island. July 22, 1908. Length, 116 mm.
1 example, Pasacao, Ragay Gulf. March 9, 1909. Length, 115 mm.

2 examples, Philippines. Length, 77 to 100 mm.
15 examples, Polloc, Mindanao. May 22, 1908. Length, 83 to 120 mm.
2 examples, Port Caltom. December 15, 1908. Length, 72 to 133 mm.
15145. Port Dupon, Leyte Island. March 17, 1909. Length, 94 mm.
10316 and 10507. Port Maricaban. 9 examples. July 21, 1908.
12647, 12648, 14582. Port Palapag. June 3, 1909. 4 examples. Length, 60 to 114 mm.
13197. Quinalasag Island, Masamat Bay. June 12, 1909. 4 examples. Length, 83 to 120 mm.
3 examples, Rapu Rapu Island. June 22, 1909. Length, 87 to 95 mm.
1 example, Sablayan, Mindoro. December 13, 1908. Length, 128 mm.
1 example, San Miguel Harbor, Ticao Island. April 21, 1908. Length, 117 mm.
12673 and 12674. San Miguel Island. June 4, 1909. Length, 120 to 128 mm.
1 example, Simaluc, Bisibisi. September 23, 1909. Length, 105 mm.
12678. Tabaco Bay. June 4, 1909. Length, 95 mm.
14409 and 14410. Talisse Island. November 9, 1909. 3 examples. Length, 44 to 120 mm.
19213 and 19218. Tapiantana Island. September 13, 1909. Length, 105 to 114 mm.
3 examples, Tara Island. December 15, 1908. Length, 104 to 108 mm. [800.] Slaty above; breast pale; region below bright yellow; posterior portion of anal and dorsal, caudal and caudal peduncle pale, edges of anal and dorsal otherwise blackish; ventrals bright yellow; pectorals dusky, with black blotch on upper base.
4 examples, Tutu Bay, Jolo Island, First Anchorage. Length, 92 to 123 mm.
11680. Tutu Bay, Jolo Island. September 18, 1909. Length, 108 mm.
13249, 13250, 13624. Birabirahan Island, off Borneo. December 31, 1909. Length, 110 to 128 mm.
14325 and 14326. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. 5 examples. Length, 98 to 130 mm.
14128. Tifu Bay, Bouro Island. December 10, 1909.
13699. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 120 mm.
14851 and 14852. Dodepo and Pasejogo Islands. November 16, 1909. Length, 103 to 107 mm.
13665. Limbe Strait, Celebes. November 10, 1909. Length, 120 mm.
13641 and 14923. Una Una Road, Binang Unang Island, Celebes. November 18, 1909. Length, 108 to 132 mm.
3 examples, west of Malibagu Point, Gulf of Tomini, Celebes. November 21, 1909. Length, 94 to 118 mm.
1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 124 mm.

ABUDEFDUF UNIOCELLATUS (Quoy and Gaimard)

Glyphisodon uniocellatus Quoy and Gaimard, Voy. Uranie Zool., 1825, p. 393, pl. 64, fig. 4. Coupang, Timor?, Mariannes.—Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 481 (Timor and Vanicolo).—Schlegel and Müller, Nat. Ges. Nederl. Zool., vol. 2, 1839–44, p. 23 (Vanicolo, Timor, Java).

Glyphidodon uniocellatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 52 (Fiji).—Klunzinger, Sitz. Akad. Wiss. Wien, vol. 56 (1), 1867, p. 328 (Port Jackson).—Károli, Termez. Füzetek, Budapest, vol. 5, 1881, p. 173 (Ceylon).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 234, pl. 128, fig. A (East Indies, Fiji, Solomons, Samoa, Tonga, Marquesas, Fatuna).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 27 (Ambon).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 440 (Ternate).

Glyphidodontops uniocellatus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 6; Nat. Verh. Holl. Maatsch. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 133 (Borneo, Letti, Timor, Batjan, Amboina, Haruco, Goram, Philippines).

Chrysiptera gaimardi SWAINSON, Nat. Hist. An., vol. 2, 1839, p. 216.

Glyphidodon assimilis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 52. Borneo, Philippines, Indian Seas.—PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 271 (Paracali, Luzon).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 34 (Sangi).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 548 (Luzon, Manila).

Depth 2⅗ to 3; head 3⅓ to 3⅔, width 1⅔ to 1⅘. Snout 4 to 4⅔; eye 2⅓ to 3¼, much greater than snout or interorbital; maxillary reaches little beyond front eye edge or to front pupil edge in young, 3 to 3⅛ in head; interorbital 3 to 3⅞, broadly convex; preorbital and preopercle edges entire. Gill rakers 6+12, lanceolate, moderate.

Tubes in lateral line 15 to 17, followed by 3 to 5 irregular pores; pores in straight section 7 to 9 to caudal base (abnormally 4), 0 to 2 on latter; 3 scales above lateral line, 10 below, 14 or 15 predorsal forward opposite front eye edge; infraorbitals naked, cheek with 3 rows of scales. Scales with 8 basal radiating striae and many as 5 auxiliaries marginally frequent; apical denticles 54 to 103, with 2 or 3 transverse series of basal elements; circuli extremely fine.

D. XIII, 11, 1 to 13, 1, fourth spine 1⅘ to 2⅕ in head, sixth ray 1 to 1½; A. II, 12, 1 to 14, 1, second spine 1¾ to 2, eighth ray 1 to 1⅔; caudal emarginate, 2⅞ to 3 in combined head and body; least depth of caudal peduncle 1⅞ to 2 in head; pectoral 1 to 1⅛; ventral 2⅞ to 3¼ in combined head and body.

Back and sides above bright blue, under surface of head and abdomen whitish, becoming pale brown in spirits. Along side of body, especially below, many small scattered pale blue spots, each bordered or ringed with pale dusky. Dusky median frontal streak from interorbital to spinous dorsal. Dusky brown band wide as pupil from snout tip through eye and continued behind eye as several spots until up above and parallel along lateral line. Another similar paler band from side of maxillary, with series of several brownish spots across opercles. Iris pale greenish, except dark cross invading from snout. Fins all pale brownish. Margins of spinous dorsal dusky, base blue. Soft dorsal with blue basally and large slaty black blotch, little smaller than eye, at bases of last 6 rays. Caudal bluish basally. Ventral with slight dusky tint to end of first ray.

Ceylon, East Indies, Melanesia, Micronesia, Polynesia. A very beautiful little fish, known by its showy blue coloration.

2 examples, Tataan Island, Simaluc Island. February 18, 1908. Length, 47 to 49 mm.

1 example, Tataan Island. February 20, 1908. Length, 30 mm.

5 examples, Tomahu Island. December 11, 1909. Length, 45 to 52 mm.

15112 U.S.N.M. Samoa. Steinberger. Length, 40 mm. 1 example.

9652 A.N.S.P. Samoa. Dr. H. C. Caldwell. Length, 33 mm.

31497 to 31512 A.N.S.P. Apia. Bureau of Fisheries. Length, 38 to 65 mm.

ABUDEFDUF SAPPHIRUS Jordan and Richardson

Abudefduf sapphirus Jordan and Richardson, Bull. Bur. Fisher, vol. 27, 1907 (1908), p. 264, fig. 10. Ticao, Philippines.

Abudefduf parasema Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 56, fig. 22. Philippines.

Depth 2 to 2⅛; head 3 to 3⅙, width 1⅔ to 1⅘. Snout 3⅓ to 3¾; eye, 2⅔ to 3, greater than snout or interorbital; maxillary to slightly beyond front eye edge, 2⅘ to 3¾ in head; teeth small, uniserial, ends truncate; interorbital 2½ to 2⅞, convex; preorbital deeply notched, but entire along edge; preopercle edge entire. Gill rakers 4+16, lanceolate.

Tubes in lateral line 13 to 15, followed by 3 or 4 pores; pores in straight section 8 or 9 to caudal base; 2 or 3 scales above lateral line to spinous dorsal origin and 8 or 9 below; 15 to 19 predorsal scales. Scales with 6 to 9 basal radiating striae; apical denticles 64 to 73, with 1 or 2 series of basal elements; circuli fine.

D. XIII, 11, 1, fifth spine 1⅘ to 2 in head, third ray 1⅗ to 2; A. II, 12, 1, second spine 1⅗ to 1¾, third ray 1⅓ to 1⅗; caudal 1⅕ to 1¼, slightly emarginate behind; least depth of caudal peduncle 2 to 2$\frac{1}{10}$; pectoral 1⅛ to 1⅓; ventral 1 to 1⅛.

Light blue generally. In some examples caudal fin and caudal peduncle pale or whitish in contrast and pale color may even extend forward along abdomen to chest or head. Muzzle with 4 oblique dusky streaks. Each scale on head with dusky blotch, and on trunk and tail each scale with dark vertical bar.

An exquisite little fish, brilliant blue, and abundant in the Philippines. We have several variants in which the tail and caudal fin is white and others in which the white extends well forward to the head.

7 examples, Batan Island. June 5, 1909. Length, 22 to 29 mm. [1559.]

2 examples, Biri Channel, Balicuatro Island. June 1, 1909. Length, 46 to 53 mm. [1548.] Bright bluish purple, except caudal peduncle, which yellow; base of caudal orange and distal portion dusky hyaline; edges of soft dorsal and anal vertically dusky hyaline; black spot on upper base of pectoral; blackish bar from eye to eye across nose and more or less blackish stripes on side of head; body of spinous dorsal black, front and tips of spines blue. Black markings developed after some time in spirits, body scales showing vertical bar.

1 example, Biri Channel. June 2, 1909. Length, 44 mm.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 45 mm.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 48 mm.

4 examples, Busin Harbor, Burias Island. March 7, 1909. Length, 46 or 47 mm.

103, 312, 313. Busin Harbor. March 8, 1909. 9 examples. Length, 38 to 52 mm.

5 examples, Busin Harbor. April 23, 1908. Length, 42 to 48 mm.

1 example, Butauanan Island. June 13, 1909. Length, 53 mm.

3 examples, Canimo Island, near Daet. June 15, 1909. Length, 43 to 49 mm.

6 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 38 to 47 mm. [550 to 556.] Ultramine and indigo, latter post-mortem; posteriorly pale

orange; caudal with terminal parts of rays very pale slaty gray, membranes hyaline; dorsal and anal color of body, similar to tip of caudal distally and on vertical portion of fins; ventral black distally; pectoral slightly dusky, black blotch on upper part of base.

1 example, Cataingan Bay, Dumurug Point, Masbate. April 19, 1908. Length, 52 mm.

4 examples, Danawan Island and Si Amil Island. September 26, 1909. Length, 37 to 51 mm.

42 examples, Danawan Island and Si Amil Island. September 27, 1909. Length, 36 to 55 mm.

3 examples, Doworra Island. December 2, 1909. Length, 35 to 54 mm.

1 example, Endeavor Strait, beach at village near Chase Head, Palawan. December 22, 1908. Length, 45 mm.

5 examples, Endeavor Strait. December 22, 1908. Length, 45 to 52 mm.

79. Endeavor Strait. December 23, 1908. 11 examples. Length, 38 to 52 mm.

3 examples, Gubat Bay, Luzon. June 23, 1909. Length, 13 to 29 mm.

1 example, Mabul Island. September 29, 1909. Length, 48 mm.

2 examples, Makesi Island, Palawan. April 5, 1909. Length, 47 mm.

1 example, Makyan Island. November 29, 1909. Length, 44 mm.

3 examples, Mantacao Island, Bohol. April 8, 1908. Length, 28 to 38 mm.

1 example, Pendek Island. December 15, 1909. Length, 50 mm.

1 example, Philippines. Length, 45 mm.

1 example, Port Maricaban. July 21, 1908. Length, 39 mm.

3 examples, Port Matalvi, Luzon. November 23, 1908. Length, 38 to 48 mm. [713,715.]

23 examples, Port Palapag. June 3, 1909. Length, 12 to 41 mm.

22531 [816]. Port Uson, west side of Pinas Island. December 19, 1908. Length, 44 mm. Brilliant purplish blue, except peduncle and caudal which bright cadmium orange; distal half of fin dusky; soft dorsal and anal distally rather dusky; ventral black; pectoral dusky; small black blotch on upper base of pectoral; another near upper angle of opercle.

1294. Ragay Bay, Ragay Gulf. March 10, 1909. 12 examples. Length, 43 to 54 mm.

11 examples, Rapu Rapu Island. June 22, 1909. Length, 38 to 43 mm.

466. Romblon. March 26, 1908. Length, 50 mm.

14049. Sacol Island. September 9, 1909. 2 examples. Length, 45 to 50 mm.

6 examples, Tataan Bay, Tataan Island, Tawi Tawi Group. February 20, 1908. Length, 50 to 55 mm. [151.] Brilliant Prussian blue, with sapphire shades under pectoral extended. Dorsal body color; distal portion of soft part dusky hyaline. Caudal peduncle and base of caudal orange, body portion paler, becoming greenish meeting blue; distal half of caudal dusky hyaline. Anal body-color, posterior distal portion slaty. Ventral slaty. Pectoral pale gray, with black spot at base; axil dark. Iris body-color.

981. Ulugan Bay. December 29, 1909. 1 example.

3 examples, Buka Buka Island, Gulf of Tomini, Celebes. Length, 39 to 42 mm.

2151. Great Tobea Island, Dutch East Indies. December 15, 1909. Length, 50 mm. Side Prussian blue, becoming indigo above, from throat along under base of pectoral diagonally upward to top of peduncle line below which all cadmium orange; dorsal indigo except distal and posterior portions of soft fin, which dusky hyaline; distal ¾ of caudal dusky hyaline, front and anterior margin narrowly bordered brown; ventrals orange and narrow front dark; pectoral dusky hyaline; margins of scales on side of head very narrowly black.

18 examples, Gane Road, Gillolo Island, Moluccas, Dutch East Indies. December 1, 1919. Length, 34 to 46 mm. [2093.] Prussian blue, vertical fins dusky slate distally; in alcohol scale centers become dusky or blackish with pale line in front, or at base of scale, giving appearance of black bars down and forward and narrower pale bars down and backward; black band with pale edges across snout and through eye, top of head sky-blue, mottled with black. Pale shades throughout nearly sky blue.

61682 U.S.N.M. Ticao. R. C. McGregor. Length, 31 to 44 mm. Types of *Abudefduf sapphirus*.

47533 to 47537. A.N.S.P. Philippines. Commercial Museum of Philadelphia. Type and paratypes of *Abudefduf parasema*.

ABUDEFDUF AMABILIS (De Vis)

Glyphisodon amabilis De Vis, Proc. Linn. Soc. New South Wales, vol. 8, 1884, p. 452. South Sea Islands.

Abudefduf amabilis Jordan and Seale, Bull. Bur. Fisher, vol. 25, 1905 (1906), p. 287, pl. 42, fig. 1 (Apia, Samoa).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 264 (Calayan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Tanegashima, Japan).

Glyphidodon brownriggi var. *xanthozona* (not Bleeker) Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 234, pl. 127, fig. D (Oualan, Futuma. Samoa, Tahiti, Ponape).

Depth 2½ to 2¾; head 3⅖ to 3½, width 1⅔ to 2. Snout 2⅖ to 3⅕; eye 2⅖ to 3⅕, greater than snout or interorbital; maxillary reaches opposite front pupil edge, 2¾ to 3 in head; teeth uniserial, compressed, incisorlike, anterior or larger slightly bifid; interorbital 3⅖ to 3⅘ in head, little convex; infraorbital and suborbital edges entire and free, also preopercle edge. Gill rakers 8+12, slender, lanceolate, rather long.

Tubes in upper section of lateral line 19, followed by 2 or 3 irregular pores; pores in straight section 8+1 to 3; 3 scales above lateral line, 9 below, 16 or 17 predorsal forward to nostrils; preorbital naked, infraorbitals with single row of scales; cheek below with 3 rows of scales to preopercle ridge, flange naked. Scales with 10 to 12 basal radiating striae, edge scalloped; apical denticles 48 to 95, with 1 to 5 series transversely of basal elements; circuli very fine.

D. XIII, 12, 1 or 13, 1, fifth spine 1½ to 2 in head, fifth ray 1¼ to 1⅓; A. II, 12, 1, second spine 1⅔ to 1⅘, fifth ray 1⅕ to 1¼; caudal 3⅛ to 3⅓ in combined head and body, emarginate behind; least depth of caudal peduncle 1⅘ to 2 in head; pectoral 1⅛ to 1⅕; ventral 3 to 3¼ in combined head and body.

Body seal-brown generally, largely uniform. White bar vertically includes hind half of opercle. White vertical band from fourth to sixth dorsal spines, extending below nearly or quite to vent, 2 scales wide. White vertical band, 2 scales wide, on front of caudal peduncle. Vertical fins and ventrals all seal-brown like body. Pectorals dark brown. Iris dark brown, with yellowish circle around pupil.

Philippines, Japan, Micronesia, and Polynesia. Though not recorded from the East Indies and Melanesia, it doubtless occurs there. Its coloration somewhat suggestive of *Abudefduf albofasciatus*, though generally more dark.

2 examples, Nogas Point, Panay. February 4, 1908. Length, 40 mm.
52300 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 44 examples. Length, 35 to 68 mm.
70746 U.S.N.M. Tanegashima, Japan. *Albatross* collection. 1 example. Length, 44 mm.
31485 to 31518 A.N.S.P. Apia. Bureau of Fisheries. 29 examples. Length, 40 to 70 mm.

ABUDEFDUF ALBOFASCIATUS (Hombron and Jacquinot)

Glyphisodon albofasciatus Hombron and Jacquinot, Voy. Astrolabe, Zool., vol. 3, 1853, p. 49, pl. 5, fig. 4. Poulolant Group of Borneo Island, Malaysia.

Glyphidodon albofasciatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 43 (copied).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Samar, Borongan).

Glyphidodontops albofasciatus Bleeker, Atlas Ichth. Ind. Nèerl., vol. 9, 1877, pl. 405 (6), fig. 6; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 136 (Sumatra, Borneo, Celebes, Buru, Amboina, Ceram, Philippines).

Abudefduf albofasciatus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 354 (Karkaralong Island, Tiur Island, Rama Island).

Glyphisodon xanthozona Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 283. Cauer.

Glyphidodon xanthozona Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 442 (Seychelles).—Károli, Termez. Füzetek, Budapest, vol. 5, 1881, p. 173 (Ceylon).

Glyphidodon taenioruptus Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 101. Bohol.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 546 (Bohol).

Depth 2½; head 3¾. Snout 4; eye 3, greater than snout; maxillary reaches front pupil edge, 2⅖ in head; interorbital little convex.

Tubes 18 in upper section of lateral line; pores in straight section 8+2; 2 scales above lateral line, 9 below, 13 predorsal, nearly forward to nostril?; preorbital and antero-infraorbitals naked; 3 rows of scales on cheek.

D. XIII, 13, fifth spine 1⅘ in head, fifth ray 1⅓; A. II, 12, second spine 1¾, first ray 1⅛; caudal 3½ in combined head and body, emarginate behind; least depth of caudal peduncle 2 in head; pectoral 1$\frac{1}{10}$; ventral 3 in combined head and body.

Olivaceous generally, with 3 whitish vertical bands; first from below second scale of lateral line behind pectoral axil to behind ventral axil; second from between bases of fifth and sixth dorsal spines obliquely to vent; third across middle of caudal peduncle and adjoins blackish band, which also includes caudal base. Iris yellowish. Cheeks and lower side of head with whitish spot on each

scale. Lips brown. Spinous dorsal gray. Soft dorsal slaty basally, broadly brown terminally. Caudal slaty over basal half, terminal half pale brown, with rather broad margin of deeper brown. Anal brown basally, terminal half slate. Pectoral pale yellowish basally, terminally broadly slaty. Ventral whitish basally, outer front margin terminally slaty. Length, 80 mm. (Hombron and Jacquinot.)

Seychelles, Ceylon, East Indies, Philippines. We have followed Bleeker in the synonymy of this species. No examples were obtained by the *Albatross*.

ABUDEFDUF ZONATUS (Cuvier)

Glyphisodon zonatus Cuvier, Hist. Nat. Poiss., vol. 5, 1830, p. 483. New Guinea and Vanicolo.—Schlegel and Müller, Verh. Nat. Ges. Nederl. Zool., 1839–1844, p. 24.—McCulloch, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 423 (Murray Island).—Whitley, Australian Zoologist, vol. 4, pt. 14, April, 1926, p. 230, pl. 33 (Murray Island, Two Isles, North-west Islet).

Glyphidodon zonatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 528 (note).

Glyphidodontops zonatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 407 (8), fig. 3; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 138 (Cocos Island, Java, Borneo, Celebes, Ceram, Amboina, New Guinea, Philippines).

Abudefduf zonatus Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 92 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 263 (Cagayancillo).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 419 (Tanegashima), p. 550 (Okinawa).

Abudefduf brownriggii var. *zonatus* Weber, Siboga Exp., vol. 57, Fische, 1913, p. 353 (Sanguisapo, Sulu Archipelago, Kangeang, Salibabu, Damar, Gisser, Sula Besi, Nusa Laut).

Glyphidodon cingulatus Kner, Sitz. Akad. Wiss. Wien, vol. 56, 1867, p. 725. Samoa.—Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1874, p. 101 (Ubay, Bohol).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 546 (Ubay, Bohol).

Glyphodon albocinctus Kner, Sitz. Akad. Wiss. Wien, vol. 56, 1867 pl. 4, fig. 2. No locality.

Glyphidodon albocinctus Kner, Sitz. Akad. Wiss. Wien, vol. 57 (1), 1868, p. 351 (Fiji).

Glyphidodon leucozona (not Bleeker) Kner, Sitz. Akad. Wiss. Wien, vol. 57 (1), 1868, p. 350 (Savay, Samoa).

Glyphidodon brownriggii (not Bennett) Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 232, pl. 127, figs. *a*, *c*, *f*. (Society Islands, Samoa, Bonin Islands).

Depth 2⅕ to 2¼; head 3 to 3⅛, width 1⅘ to 1⅞. Snout 3⅛ to 3¼; eye 2⅘ to 3, greater than snout or interorbital; maxillary reaches front eye edge or slightly beyond, 3 to 3⅛ in head; teeth compressed, uniserial incisors, end of each slightly notched; interorbital 3⅔ to 4, broadly convex; preorbital, infraorbital and preopercle edges entire. Gill rakers 9 +14, lanceolate, moderate.

Tubes in lateral line 15 to 17, followed by 3 or 4 irregular pores; pores in straight section 8 or 9 to caudal base and 1 or 2 more on latter; 3 scales above lateral line, 9 below, 13 or 14 predorsal forward opposite front eye edge; preorbital, infraorbital and preopercle flange naked; 3 rows of scales on cheek. Scales with 6 or 7 basal radiating striae; apical denticles 77 to 86, basal elements in 3 or 4 transverse series; circuli fine.

D. XIII, 13, 1, thirteenth spine 1⅘ to 2⅕ in head, sixth ray 1⅕ to 1¼; A. II, 13, 1, second spine 1¾ to 2, seventh ray 1⅕ to 1¼; caudal emarginate, 1 to 1⅛; least depth of caudal peduncle 2 to 2⅕; pectoral 1 to 1⅛; ventral 3 in combined head and body.

Largely uniform olivaceous brown, not paler below. At present scales without blue spots. A faint transverse band on back, crosses lateral line at fifth to seventh scale of its course, and faintly down until opposite pectoral base. Iris dark brown. Vertical fins more or less dusky brown, also ventrals. Pectoral paler brown.

East Indies, Philippines, Riu Kiu, Japan, Melanesia, Micronesia, Polynesia. Similar to *Abudefduf glaucus*, but without the blue line, variously incomplete, from the snout tip up above eye to origin of spinous dorsal. It resembles *Abudefduf leucozona* but is without the black ocellus at the juncture of the spinous and soft dorsal.

1 example, Batan, Rapurapu Strait, tide-pool. June 5, 1909. Length, 74 mm. [1596.] Very dark slaty, median bar of brassy about diameter of eye downward from fifth dorsal membrane to about level of pectoral; caudal yellowish; small black speck in axil of dorsal; in young of 1¼ inches markings the same with addition of large black spot on last three dorsal spines near bases.

18 examples, Batan. June 5, 1909. Length, 23 to 62 mm.

11 examples, Batan Island. July 22, 1909. Length, 26 to 52 mm.

21650, Cebu Market. August 28, 1909. Length, 42 mm.

1 example, Cebu, reef opposite. April 7, 1908. Length, 90 mm.

1 example, Maculabo Island. June 14, 1909. Length, 36 mm.

1 example, Mahinog, Camiguin Island. August 3, 1909. Length, 44 mm.

6 examples, Pilas Island. September 12, 1909. Length, 34 to 49 mm.

3 examples, Port Palapag. June 3, 1909. Length, 48 to 69 mm.

8 examples, Sablayan, Mindoro. December 13, 1908. Length, 24 to 82 mm.

43 examples, Simaluc, Bisibisi Island. September 22, 1909. Length, 14 to 81 mm.

23 examples, Simaluc. September 23, 1909. Length, 25 to 80 mm.

3 examples, Singaan Island. September 21, 1909. Length, 86 to 88 mm. 19537.

1 example, Tataan, Simaluc Island. February 18, 1908. Length, 63 mm.

1 example, Tutu Bay, First Anchorage, Jolo Island. September 19, 1909. Length, 47 mm.

7 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 31 to 90 mm.

52195 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 40 to 90 mm. 12 examples.

56191 U.S.N.M. Luzon, Philippines. Philippine Commission. Length, 66 mm.

65719 U.S.N.M. Jaluit, Marshall Islands. Length, 91 mm. 1 example.

70747 U.S.N.M. Tanegashima. *Albatross* collection. Length, 24 to 35 mm. 4 examples.

71650 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 17 to 63 mm. 8 examples.

31196 and 31197 A.N.S.P. Apia, Samoa. Bureau of Fisheries. Length, 63 to 69 mm.

ABUDEFDUF AZYSRON (Bleeker)

Pomacentrus (*Pomacentrus*) *azysron* Bleeker, Nat. Verh. Holl. Maatsch. Wet. Harlem (No. 6), ser. 3, vol. 2, 1877, p. 50. Amboina.

Pomacentrus azysron Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 1.

Depth 2½ to 2¾; head 3⅓ to 3½, width 1⅘ to 1⅞. Snout 4¼; eye 3 to 3½, greater than snout, equals interorbital; maxillary extends to or slightly beyond eye front, 3 to 3⅖ in head; teeth uniserial; interorbital 2⅞ to $3\frac{1}{10}$, broadly convex; hind preopercle edge uneven, not serrated; infraorbitals not free. Gill rakers 9+15, long, slender, lanceolate.

Tubes in lateral line 15 to 17, pores in straight section 8 or 9+1; 3 scales above lateral line to spinous dorsal origin, 8 below, 18 or 19 predorsal; 4 or 5 rows of cheek scales including infraorbital row. Scales with 7 basal radiating striae; apical denticles 101 to 113, with 3 transverse series of basal elements; circuli very fine.

D. XIII, 10, 1, thirteenth spine 2 to 2¼ in head, fifth ray 1 to 1¾; A. II, 10, 1, second spine 1⅞ to 2⅛, fifth ray 1⅓ to 3⅕ in combined head and body; least depth of caudal peduncle 2 in head; pectoral 1; ventral 1; caudal 2¼ to 2⅘ in combined head and body, well forked.

Head and body deep neutral brown, inclining to dusky on back and to blackish on dorsal fins. Head paler below. Iris neutral dusky, with yellowish ring around pupil. Apparently no blue spots. Posterior half of soft dorsal, most of caudal peduncle and all of caudal pale yellowish, filaments from upper caudal lobe dusky. Rest of fins pale brown, with large blackish blotch over entire base of pectoral.

Known only from Amboina and the Philippines. Distinguished from all the other species of the genus by its coloration. Although Bleeker places this species in *Pomacentrus*, our examples are inseparable from his account of *Pomacentrus azysron*, but their truncate teeth and entire preopercle edges demand location with *Abudefduf*.

2 examples from Quinalasag Island, Masamat Bay. June 12, 1909. Length, 64 to 77 mm.

ABUDEFDUF BANKIERI (Richardson)

Glyphisodon bankieri Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. China Japan), 1846, p. 253 Hong Kong, China Seas.

Glyphidodon bankieri Günther, Cat. Fish. Brit. Mus., vol. 4, 1868, p. 54 (types of *Glyphisodon bankieri* and *G. nemurus*).—Alleyne and Macleay, Proc Linn. Soc. New South Wales, vol. 1, 1876, p. 343 (Cape Grenville).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 548 (Luzon, Santa Cruz, Cavite).

Parapomacentrus bankieri Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 408 (9), fig. 8; Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 67 (Buru, Ceram, Amboina, Timor).

Abudefduf bankieri Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 92 (Bacon).

Glyphisodon nemurus Bleeker, Nat. Tijds. Ned. Indie, vol. 13, 1857, p. 73 (Kajeli and Amboina).

Depth 2⅕ to 2⅓; head 3⅛ to 3½, width 1⅞ to 2. Snout 4½ to 4¾; eye 3⅛ to 3½, greater than snout, 1 to 1⅕ in interorbital; maxillary little beyond front eye edge, 3 to 3⅕ in head; teeth uniserial, truncate, scarcely notched though forming nearly continuous cutting edge; interorbital 3 to 3⅛, broadly convex; hind preopercle edge jagged, rough, uneven, though hardly distinctly serrate. Gill rakers 7+15, lanceolate, long, slender.

Tubes in lateral line 13 or 14, pores in straight section 8+0 or 1; 3 scales above lateral line, 8 below, 17 or 18 predorsal; 4 rows of cheek scales, of which uppermost extending over infraorbital, which not free from cheek. Scales with 8 to 10 basal radiating striae; apical denticles 102 to 113, with 3 series of basal elements transversely; circuli fine.

D. XIII, 11, 1, thirteenth spine 1⅗ in head, third ray 2¼ to 3⅛ in combined head and body; A. II, 11, 1, second spine 1½ in head, sixth ray 3⅗ to 3¾ in combined head and body; caudal 2$\frac{1}{10}$ to 2⅓, deeply forked; ventral 3⅛ to 3⅗; least depth of caudal peduncle 1¾ to 1⅞ in head; pectoral 1 to 1$\frac{1}{10}$.

Body brown, paler below, most everywhere spotted with bluish; spots scattered and rather variable, extend only on bases of soft vertical fins. Iris yellowish, neutral above. Slaty blue spot, little larger than pupil at suprascapula. Lips little dusky. Spinous dorsal neutral dusky and this shade extending along upper edge of soft dorsal. Other fins all pale brownish to yellowish, with small black spot, less than pupil in size, at pectoral origin.

East Indies, Philippines, China, Queensland.

3 examples, Bumbum Island. September 25, 1909. Length, 66 to 80 mm.
2 examples, Caracaran Island, Batan. June 8, 1909. Length, 50 to 53 mm.
20559. Nasugbu, Luzon shore. January 16, 1908. Length, 64 mm.
2 examples, Port Jamelo, Luzon. July 13, 1908. Length, 73 or 74 mm.
56256 U.S.N.M. Luzon. Length, 60 mm.

ABUDEFDUF MELANOCARPUS, new species

Depth 2½ to 2¾; head 3⅖, width 1⅕ to 2. Snout 4⅛ to 5 in head; eye 3⅛ to 3⅓, much greater than snout, 1 to 1⅕ in interorbital; maxillary oblique, reaches opposite eye, 3 to 3⅛ in head; teeth single row of small, compressed, truncate incisors in each jaw; interorbital 3 to 3⅛, convex; suborbitals not free; preopercle edge entire. Gill rakers 7+15, lanceolate, slender, much longer than gill filaments or 1⅓ in eye.

Scales 17 or 18 in upper tubular section, followed by 2 or 3 irregular pores, and 9 pores in lower or straight section to caudal base, with 1 or 2 more on latter. Infraorbitals and cheek closely scaled, with 4 rows of scales across. Scales with 8 basal radiating striae; apical denticles 90 to 117, with series of basal elements transversely; circuli very fine.

D. XIII, 10, 1, last spine 2 in total head length, each spine with well-developed terminal cutaneous flap, fifth ray 1⅛ to 1¼; A. II, 10, 1, second spine 2, sixth ray 1⅓ to 1⅖; least depth of caudal peduncle 2; caudal deeply forked, 2⅔ to 3 in combined head and body; pectoral 1 to 1⅛ in head; ventral 3½ to 3⅔ in combined head and body.

Head and body warm brown above, becoming paler with some soiled appearance below. Lower side of head, breast, belly, tail, bases of caudal and anal with small clear blue-white spots or dots, about 1 to each scale. Iris brown. Spinous dorsal and upper edge of soft dorsal dusky brown, remaining greater part of soft dorsal yellowish white. Caudal peduncle much paler than front of tail and shades paler posteriorly into yellowish white of caudal fin. Anal yellowish white. No dark blotch at shoulder or suprascapula. Paired fins pale or whitish, ventrals yellowish white and pectoral base with large blackish brown blotch over greater basal portion, larger than pupil though smaller than eye; similar blackish brown blotch within axis.

Known only from the several specimens listed below. The species is closely related to *Abudefduf bankieri* but differs at once in the markings. It has no dark shoulder blotch as in that species and its dark pectoral base is many times more extensive.

Type.—Cat. No. 89965, U.S.N.M.

205. Cabugao Bay, Catanduanes Island. January 9, 1909. Length 75 mm. Type.
204. Same data. Length, 73 mm.
21207. Lianga Bay. Length, 63 mm.

(*Melas*, black; *carpus*, wrist, with reference to the pictoral base.)

ABUDEFDUF ANABATOIDES (Bleeker)

Glyphisodon anabatoides Bleeker, Verh. Batav. Genoot. (Labr.), vol. 21, 1846–47, p. 28. Java.

Glyphidodon anabatoides Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 54 (Java).

Pomacentrus anabatoides Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 408 (9), fig. 7.

Pomacentrus (*Pseudopomacentrus*) *anabatoides* Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 51 (Java, Bawean).

Depth 2⅖ to 2½; head 3⅖ to 3⅔, width 1⅔ to 2. Snout 3¾ to 4; eye 3⅛ to 3⅕, 1⅙ to 1⅕ in interorbital; maxillary reaches eye, 2¾ to 2⅞ in head; teeth uniserial, truncate, compressed; in-

terorbital 2⅜ to 2⅘, broadly convex. Gill rakers 8+17, lanceolate, slender, long.

Tubes in lateral line 16 to 18, pores in straight section 7 to 11+; 4 scales above lateral line to spinous dorsal origin, 9 or 10 below, 20 or 21 predorsal; 4 rows of large cheek scales. Scales with 7 to 9 basal radiating striae; apical denticles 83 to 95, with 3 or 4 series of transverse basal elements; circuli very fine.

D. XIII, 11, 1, thirteenth spine 2 to 2$\frac{1}{10}$ in head, fifth ray 1¼ to 1¼; A. II, 11, 1, second spine 1⅞ to 2, sixth ray 1⅙; least depth of caudal peduncle 2 to 2⅓ in head; pectoral 1 to 1⅛; ventral 1 to 1$\frac{1}{10}$; caudal 2¼ in combined head and body, deeply forked.

Back deep sepia brown, shading paler on sides to light or whitish underneath belly. Each scale on back and sides above with pale blue basal spot, rather large and distinct as longitudinal rows, especially on caudal peduncle. Head brown, but slightly paler below and with few blue spots only scattered about opercles. No blue predorsal spots. Iris coppery brown. Dorsals dusky, spotted with blue, spots large and conspicuous on soft fin basally. Anals brownish, spotted with blue basally. Caudal gray brown, generally pale, with broad dark or blackish band down each lobe well contrasted. Paired fins dull brown, with dusky blotch at pectoral origin nearly large as pupil. Also neutral dusky suprascapular blotch, though less conspicuous and same size.

Known previously only from Java and Bawean in the East Indies. The list of material below will show its distribution in the Philippines. It approaches *Abudefduf richardsoni* Snyder, from Riu Kiu, of which we have compared the types in the United States National Museum. The color pattern is largely similar.

Abudefduf anabatoides differs in the dark suprascapular blotch and the great amount of blue spots, none of which is present *Abudefduf richardsoni*. Moreover we note in the latter that some examples have the hind preopercle edge entire, while in others it is weakly serrated.

5 examples, Bolalo Bay, Palawan Island. December 2, 1908. Length, 52 to 63 mm.

3 examples, Busin Harbor, Burias Island. June 2, 1909. Length, 42 to 62 mm.

6 examples, Cataingan Bay, Masbate. April 18, 1908. Length, 50 to 80 mm.

6 examples, Catbalogan, Samar. April 16, 1908. Length, 40 to 78 mm.

3 examples, Endeavor Strait. December 23, 1908. Length, 43 to 58 mm.

3 examples, Ligpo Point, Balayan Bay, Luzon. June 18, 1908. Length, 52 to 70 mm.

1 example, Mansalay Island, Mindoro. June 4, 1908. Length, 60 mm.

2 examples, Rasa Island, Mantaquin Bay, Palawan. April 1, 1909. Length, 70 to 75 mm.

8 examples, Surigao, Mindanao. May 8, 1908. Length, 65 to 73 mm.

20358, 20360, 20361. Nasugbu, Luzon. January 16, 1908. Length, 78 to 86 mm.

Genus HEMIGLYPHIDODON Bleeker

Hemiglyphidodon Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 91. Type *Glyphisodon plagiometopon* Bleeker, orthotypic.

Ctenoglyphidodon Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 58. Type *Abudefduf melanopselion* Fowler=*Glyphisodon plagiometopon* Bleeker, orthotypic.

Oblong ovate. Teeth uniserial incisors. Preorbitals and infraorbitals broadly naked, their edges entire. Preopercle edge entire. Gill rakers 70 to 80 on first arch, extremely fine and elongate. Dorsal with 13 spines and 13 rays. Anal spines 2, rays 14.

East Indian region. Although Bleeker described this genus he omitted the most striking character, the greatly increased gill-rakers. It was on this that Fowler founded the later *Ctenoglyphidodon*.

HEMIGLYPHIDODON PLAGIOMETOPON (Bleeker)

Glyphisodon plagiometopon Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 67. Singapore.

Glyphidodon plagiometopon Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 51 (East Indies).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 442 (Seychelles).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. 410 (11), fig. 4.—Gorgoza, An. Soc. Espanola, vol. 14, 1885, p. 73 (Manila).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 547 (Luzon, Manila).

Glyphidodon (Hemiglyphidodon) plagiometopon Bleeker, Nat. Verh. Holl. Maatsch. Harlem, (No. 6), ser. 3, vol. 2, 1877, p. 103 (Singapore, Java, Amboina).

Abudefduf melanopselion Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 59, fig. 23. Philippines.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 49 (Cebu).

Depth 1⅘ to 1⅞; head 2¾ to 3, width 1¾ to 1⅞. Snout 2¾; eye 3⅕ to 4⅛, 1⅛ to 1⅔ in snout, 1$\frac{1}{10}$ to 1½ in interorbital; maxillary ⅗ to or reaches eye, 3¼ to 3⅗ in head; interorbital 2⅞ to 3$\frac{1}{10}$, convex. Gill rakers 30 to 35+38 to 48, slender, lanceolate.

Tubes in lateral line 14 to 16, pores in straight section 5 to 8+1 or 2; 4 or 5 scales above lateral line to spinous dorsal origin, 9 below, 22 predorsal; 3 rows of cheek scales, none on infraorbital. Scales with 8 to 14 basal radiating striae; apical denticles 130 to 178, with 9 transverse series of basal elements; circuli very fine.

D. XIII, 13, I, thirteenth spine 1⅔ to 2 in head, fifth ray 1⅕ to 1⅔; A. II, 14, I, second spine 1⅞ to 2, seventh ray 1⅙ to 1⅕; caudal 1$\frac{1}{10}$, broad, little emarginate; least depth of caudal peduncle 2⅕ to 2⅓; pectoral 1⅛ to 1⅕; ventral 1$\frac{1}{10}$ to 1⅛.

Dark to light brown, more or less uniform and little paler or somewhat yellowish in young. Pale blue line from side of snout tip to eye, also blue line along lower and hind eye edge; with age these lines broken into small spots or dots; young with entire under surface of head finely dotted with blue-gray, also scattered larger pale blue-gray spots on cheeks and opercles, postocular and humeral regions.

Also many blue-gray dots or small spots at bases of anal fins and adjacent region of tail. All these blue dots obsolete or absent with age. Fins dusky brown, darker or more blackish with age, especially vertical ones and ventrals. Dusky brown blotch at base and origin of pectoral. Young with dark blotch at bases of last anal rays.

Known from the Seychelles, Philippines, and East Indies. This species, as figured by Bleeker, does not show the large dark blotch at the base of the pectoral. In every example we have examined it is constantly present and conspicuous. Most alcoholic specimens do not show the narrow blue streak or line vertically on each scale. Young examples show a pale blue line from the snout tip to the eye, also a blue line across the upper part of the iris. Sometimes a series of blue spots along infraorbital and another row along upper row of cheek scales. On row of scales above and parallel with lateral line small blue spot in middle of each scale. Opercle with some blue dots and others scattered along and over bases of dorsals. Brown spot at base of last dorsal ray.

1 example, Biri Channel. June 1, 1909. Length, 142 mm.

6 examples, Bolalo Bay, Palawan. December 21, 1909. Length, 107 to 170 mm. 10591 to 10594.

17854. Bumbum Island. September 25, 1909. Length, 135 mm.

187 and 321. Busin Harbor, Burias Island. March 8, 1909. Length, 82 to 165 mm. Black, dark slate darkest at bases of scales; scattered small purple spots arranged as indefinite rows following lateral line on upper part of body. Dorsal indistinctly margined with darker band and vertical half of soft fin washed with orange. Caudal peduncle and caudal washed with pale orange. Anal body color, narrowly tipped with blue. Ventral slaty. Pectoral dusky hyaline with greenish shades, axil and base black. Iris with narrow golden markings.

12794. Busin Harbor. April 23, 1908. 3 examples. Length, 82 to 153 mm.

14534, 14535, 14536, 14537. Butauanan Island. June 3, 1909. Length, 144 to 155 mm.

14983. Calangaman Island. March 16, 1909. Length, 177 mm.

20 examples, Candaraman Island, Balabac. January 4, 1909. Length, 96 to 165 mm.

13020. Cataingan Bay. April 17, 1908. Length, 137 mm.

5914, 5928 to 5931, 5933. Catbalogan, Samar. April 15, 1908. Length, 103 to 148 mm.

14444 and 14447. Catbalogan. April 16, 1908. Length, 158 to 160 mm.

3 examples, Cebu market. March 19-20, 1909. Length, 37 to 50 mm. [1426.] Anterior upper parts dark, posterior lower orange; head striped with blue lines; dusky ocellus under front of soft dorsal and posterior spinous dorsal.

21649. Cebu market. August 28, 1909. Length, 109 mm.

1 example, Cuyo Island. April 9, 1909. Length, 103 mm.

7 examples, Daisy Island, west of Bumbum. January 6, 1910. Length, 84 to 140 mm.

13514. Danawan Island. December 3, 1909. Length, 138 mm.

14271 to 14274. Endeavor Strait. December 22, 1908. Length, 117 to 150 mm.

78, 98, 111, 10924, 12687. Endeavor Strait. December 23, 1908. Length, 44 to 154 mm.

14378. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 148 mm.
13062. Gomomo Island. Length, 68 to 143 mm. 2 examples. December 3, 1909.
1 example, Kapoposang Island. December 28, 1909. Length, 187 mm.
1 example, Mactan, Mactan Island. April 6, 1908. Length, 143 mm.
14999, 19662, 19663. Makesi Island, Palawan. April 5, 1909. Length, 127 to 170 mm.
12135. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 172 mm.
7315 to 7316, 7318 to 7322. Mantacao Island, Bohol. April 8, 1908. Length, 135 to 163 mm.
12278 and 12279. Masbate Reef, Masbate. April 20, 1908. Length, 150 mm.
11480 and 11481. Nabatas Point, Samar. July 24, 1909. 4 examples. Length, 95 to 172 mm.
1 example, Opol, Mindanao Island. August 4, 1909. Length, 145 mm.
4 examples, Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 111 to 153 mm.
1 example, Philippines. Length, 130 mm.
10349 and 11058. Port Jamelo, Luzon. July 13, 1908. Length, 127 to 158 mm.
8769 to 8773. Port Matalvi, Luzon. November 23, 1908. 10 examples. Length, 99 to 155 mm.
1 example, Port Palapag. June 3, 1909. Length, 130 mm.
6402 and 6404, 19238. Rasa Island, Mantaquin Bay. April 1, 1909. Length, 108 to 168 mm.
1 example, Romblon Harbor. March 25, 1908. Length, 130 mm.
1 example, Sacol Island. September 9, 1909. Length, 80 mm.
12219, 12225, 14174. Santa Cruz, Marinduque. April 24, 1908. 4 examples. Length, 102 to 124 mm.
19531. Singaan Island. September 21, 1909. Length, 150 mm.
12161. Sirinao Island, Nakoda Bay. December 30, 1908. Length, 123 mm.
6669 to 6675, 6677 to 6678, 7360 to 7367. Tataan Island, Simaluc. February 19, 1908. Length, 117 to 160 mm.
4 examples, Taatan. February 20, 1908. Length, 118 to 145 mm.
1 example, Taganak Island. January 7, 1909. Length, 185 mm.
11106 to 11108. Tara Island. December 15, 1908. Length, 153 to 162 mm.
14335. Tobea Island. December 14, 1909. Length, 153 mm.
20947. Tomahu Island. December 11, 1909. Length, 153 mm.
1 example, Tumindao Island, reefs of south lagoon. February 26, 1908. Length, 125 mm.
263. Tutu Bay, Jolo, second anchorage. September 19, 1909. Length, 153 mm.
1 example, Ulugan Bay, channel north of Oyster Inlet. December 28, 1908. Length, 87 mm.
13300. Dodepo and Pasejogo Islands, Celebes. November 16, 1909. Length, 152 mm.
1 example, Togian Bay, Togian Island, Gulf of Tomini, Celebes. November 19, 1909.
21404 and 21405. Gane Road, Gillolo Island, Moluccas. December 1, 1909 Length, 148 to 154 mm.
1 example, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 160 mm.
84177 U.S.N.M. Cebu.
30610 U.S.N.M. New Guinea. From the Australian Museum. 1 example. Length, 128 mm.
47538 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 93 mm. Type of *Abudefduf melanopselion.*

Family LABRIDAE

Body oblong, elongate, compressed. Mouth terminal, moderate. Premaxillary protractile. Lips thick, with longitudinal folds or plaits. Front teeth usually strong canines and lateral teeth frequently united basally. Palate edentulous. Nostrils 2, pair each side of snout. Gill membranes somewhat joined. Pseudobranchiae well developed. Branchiostegals 5 or 6. Lower pharyngeals completely joined as 1 above and furnished with tubercular or conic teeth. Suborbital shelf not present. Entopterygoid present. Vertebrae with transverse processes from third and all ribs attached to transverse processes. Scales cycloid. Lateral line well developed, continuous, interrupted, often with an angle. Dorsal fin continuous, long, with many spines, these usually slender, 3 to 20. Anal with 2 to 6 spines. Soft dorsal and soft anal similar. Ventral with spine and 5 soft rays, placed below or slightly before pectoral.

A large family of brilliant marine fishes, many of large size. Most are tropical, though a few well represented in some subtropical or temperate regions. Partly herbivorous or carnivorous. Many feed on mollusks, their dentition being modified to crush shells. Some have been found to construct nests for their eggs and young. In the European labroids the nests are formed of seaweeds, algae, various marine animals, etc., and are constructed by both male and female. Fossil labroids occur in the Eocene and Miocene of Europe, also in the Tertiary beds in North America.

The following have been reported from the Philippines, though the records are of doubtful status.

PSEUDOLABRUS RUBIGINOSUS (Schlegel)

Listed from Luzon, Santa Cruz, and Cavite as *Labrichthys rubiginosa* by Elera.[10]

PSEUDOJULIS GIRARDI (Bleeker)

Also listed from Luzon, Manila, and Costa de Boleling by Elera.[11]

THALASSOMA FUSCUS (Lacépède)

As *Julis trilobata* by Elera,[12] from Luzon, Manila, and Navotas.

ANALYSIS OF THE GENERA

a^1. Lateral line continuous, bent abruptly behind, but not interrupted.
  b^1. Dorsal spines 11 to 13; cheeks and opercles scaly.
    c^1. BODIANINAE. Teeth not modified as 2 pairs of broad incisors with lateral cutting edges; but at least 1 pair of canines in front of each jaw; preopercle edges usually finely serrate.
      d^1. Preorbital and cheek deep.

[10] Cat. Fauna Filip., vol. 1, 1895, p. 550. [11] Idem., p. 554. [12] Idem., p. 555.

e^1. Maxillary longer, arched, reaches beyond front of eye; cheek scales large, in but 3 rows; size small---Xiphocheilus.

e^2. Maxillary shorter, scarcely arched, barely or not reaching eye; cheek scales small, inconspicuous; size large---Choerodon.

d^2. Preorbital and cheek less deep; maxillary moderate, not or quite reaching eye; cheek scales all small, size moderate or large---Lepidaplois.

c^2. PSEUDODACINAE. Each jaw with 2 pairs of broad incisors with lateral cutting edges; preopercle edge entire; cheeks and opercles scaly---Pseudodax.

b^2. CORINAE. Dorsal spines 8 or 9.

f^1. Single large scale covers entire cheek; size small---Wetmorella.

f^2. At least more than 1 scale on cheek.

g^1. Jaws exceedingly protractile, mandible greatly produced backward; size rather large---Epibulus.

g^2. Jaws normal, not produced backward.

h^1. Preopercle edge serrate; cheeks and opercles with large scales; scales 20 in lateral line; front dorsal spines elevated, filamentous in males. Duymaeria.

h^2. Preopercle entire.

i^1. Head more or less scaled, or only muzzle naked.

j^1. Mouth rather large, lips moderate; head covered with small scales, much smaller than on body; scales in lateral line 25 to 27. Labrichthys.

j^2. Mouth small, lips fleshy; head covered largely with small scales which scarcely smaller than those on body; scales in lateral line 35 to 50---Labroides.

i^2. Head less scaly, opercles scaleless or with few small scales only.

k^1. Body oblong, not cylindrical, depth less than 5; opercle scaleless.

l^1. Dorsal spines 9.

m^1. Front canines prominent, flare forward with a cutting edge; no hind canines; scales 20 to 50---Anampses.

m^2. Front canines not turned forward to form a lateral cutting edge.

n^1. Scales large, 25 to 30 in lateral line.

o^1. Thoracic scales large as other body scales, or larger; mouth small; upper canines very short, close-set, form terminal cutting edge; lower teeth similar, but longer; dorsal spines short, pungent---Stethojulis.

o^2. Thoracic scales not enlarged; front canines normal.

p^2. Lips thick, with folds, lower pendant; cheeks with small scales below---Hemigymnus.

p^2. Lips not enlarged; cheeks usually naked.

q^1. Outer front canines not flaring out or back.

r^1. Body oblong, not especially deep---Halichoeres.

r^2. Body rather short and deep---Macropharyngodon.

q^2. Outer front canines flare out and back---Leptojulis.

n^2. Scales rather small, 50 to 80 in lateral line---Coris.

n^3. Scales very small, 90 to 120 in lateral line---Hologymnosus.

l^1. Dorsal spines 8; no hind canines; scales large, none on head.

s^1. Snout short, not tube like---Thalassoma.

s^2. Snout much produced, forms tube with jaws terminal. Gomphosus.

k^2. Body elongate, subcylindrical; no hind canine; scales small; row of small scales on opercle---Cheilio.

a^2. CHEILININAE. Lateral line interrupted behind, front section concurrent with profile of back, hind or lower section horizontally median along caudal peduncle.

t^1. First 2 dorsal spines not conspicuously removed from third.

u^1. Scales large, 20 to 30 in median lateral series.

v^1. Preopercle serrate; dorsal spines 11 ..... **Cirrhilabrus.**

v^2. Preopercle entire; dorsal spines 9, rarely 10.

w^1. Jaw teeth uniserial.

x^1. Upper canines flare out and back; size small. **Pseudocheilinus.**

x^2. Upper canines not flaring out or back; size mostly moderate or large ..... **Cheilinus.**

w^2. Jaw teeth in several series ..... **Novaculichthys.**

u^2. Scales small, more than 70 in median lateral series. **Cymolutes.**

t^2. First 2 dorsal spines more or less conspicuously removed, not entirely detached; cheek with small scales. **Hemipteronotus.**

Genus XIPHOCHEILUS Bleeker

Xiphocheilus BLEEKER, Nat. Tijds. Ned. Indie, vol. 12, 1856–57, p. 223. Type *Xiphocheilus typus* BLEEKER, monotypic.

Xiphochilus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 98. Type *Xiphocheilus typus* BLEEKER.

Body oblong. Head high as long. Snout obtuse. Upper lip thin, sword-shaped, nearly capable of being entirely retracted below preorbital. Mandible slightly protrudes or conspicuous. Anterior canines 4 in each jaw; lateral teeth joined as osseus ridge; hind canine present. Preopercle denticulate. Branchiostegals 6. Scales large, 27 to 29 in lateral line, which continuous. Preopercle limbs naked, cheek scaly. Dorsals and anals without basal scales. Dorsal spines 11 to 13, rays 8 or 9. Anal spines 3, rays 9 or 10.

Species few, small, and remarkable for the saber-shaped maxillary, producing a peculiar physiognomy.

XIPHOCHEILUS QUADRIMACULATUS Günther

Xiphochilus quadrimaculatus GÜNTHER, Rep. Voy. Challenger, vol. 1, 1880, p. 45, pl. 20, fig. C. Arafura Sea.

Depth 3½ to 4; head 2⅞ to 3, width 2⅛ to 2⅙. Snout 3⅗ to 4 in head from upper jaw tip; eye 3¼ to 4, 1 to 1⅛ in snout, equals or little greater than interorbital; maxillary reaches little beyond eye front, 3⅛ to 3⅙ in head; interorbital 3⅞ to 4, broadly convex; hind preopercle edge very feebly dentate. Gill rakers 6+8, lanceolate, short.

Scales in lateral line 24+3; 3 scales above lateral line, 6 below, 8 or 9 predorsal, which extend forward opposite middle of eye; 3 rows of scales on cheek, of which lowest on preopercle flange. Scales with 11 or 12 basal radiating striae, apical 10 to 13; circuli very fine.

D. XIII, 8, 1, twelfth spine 3⅛ to 3⅕ in head, second ray 2⅗ to 3; A. III, 9, 1, or 10, 1, third spine 3¼ to 3⅗, first ray 2⅗ to 3; caudal 1¼ to 1½, hind edge slightly concave convex, tips not exserted; least depth of caudal peduncle 2¾ to 2⅞; pectoral 1⅓ to 1⅗; ventral 1¾ to 1⅘.

Largely uniform brownish, fins all pale. Lower surface of head and abdomen pale to whitish. Iris pale yellowish. On lateral line and chiefly above to dorsal base, dusky brown blotch from eighth to tenth scale of its course. Also median caudal rays deep brown, with still darker small blotch just above end of lateral line. Sometimes slightly darkened blotch on 3 or 4 scales just before end of curve of lateral line or below front of soft dorsal.

Previously known only from Günther's account of the type from the Arafura Sea. Our examples agree in most every way.

4536. Bolalo Bay, near Malampaya Island. December 20, 1908. Length, 74 mm. (Dr. 5339).

22932. Great Tobea Island, tide pools. December 16, 1909. (Dr. 5644). Length, 76 mm.

4404. Mariquina River above Monalban. January 2, 1908. Length, 76 mm.

4336. Observatory Island. December 20, 1908. Length, 76 mm. (Dr. 5337).

3986. Olongapo. January 8, 1908. Length, 79 mm.

Genus CHOERODON Bleeker

Choerodon Bleeker, Nat. Geneesk. Arch. Ned. Indie, vol. 4, 1847, p. 10. Type *Labrus macrodontus* Lacépède, monotypic.

Choirodon Bleeker, Beit. Gen. Topogr. Batavia, 1856, p. 513. Type *Labrus macrodontus* Lacépède.

Choerops Rüppell, Verz. Mus. Senckenberg. Mus. Fische, 1852, p. 20. Type *Choerops meleagris* Rüppell, monotypic.

Cossyphodes Bleeker, Act. Soc. Sci. Ind. Néerl., vol. 8, 1860, p. 37. Type *Labrus macrodontus* Lacépède, monotypic.

Hypsigenys Günther, Ann. Mag. Nat. Hist. London, vol. 8, 1861, p. 383. Type *Labrus macrodontus* Lacépède, monotypic.

Body oblong, compressed. Front obtuse, fatty hump forming with age. Canines ¼, lateral teeth confluent into blunt and osseus ridge. Hind canine in adult. Cheeks deep. Preopercle slightly serrate. Scales large, 30 in lateral line. Cheeks with small scales. Lateral line complete. Dorsal spines 13, rays 7. Anal spines 3, rays 9. Caudal blunt.

Large fishes of the western Pacific, species rather few, though often with pleasing light colors.

ANALYSIS OF THE SPECIES

a^1. Choerodon. Ventrals not reaching anal; body deeper.

b^1. No dark blotch below soft dorsal, though usually pale blotch present.

c^1. Broad oblique pink band on side anteriorly ..... azurio.

c^2. Pale wedge extends up from abdomen to highest curve of lateral line; caudal peduncle pale above and below; pectoral base dark. **anchorago.**

c^3. Median lateral yellowish band from head to caudal base. **zamboangae.**

c^4. Pale line from snout through eye; dorsals and anals edged whitish. **margaritiferus.**

b^2. Usually small black blotch at last dorsal spines and first dorsal rays; pale blotch below soft dorsal **schoenleinii.**

b^3. Large blackish blotch extends obliquely forward from soft dorsal base **melanostigma.**

a^2. MACROCHOERODON, new subgenus. Long ventrals reach well beyond front of anal; body rather slender **oligacanthus.**

Subgenus CHOERODON Bleeker

Ventrals moderate, not reaching anal. Body rather robust, not slender.

This group includes the majority of species in the genus, many in the waters of tropical Australia.

CHOERODON AZURIO (Jordan and Snyder)

Choerops azurio JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 747 (on SCHLEGEL).—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, 1902, p. 353 (Keerun, Formosa).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 614 (Tokio, Misaki, Wakanoura, Kobe, Hakata, Nagasaki, Formosa).—FRANZ, Abhandl. K. Bayer. Akad. Wiss., vol. 4, Suppl. Band 1, 1910, p. 52 (Yokohama, Fukura, Aburatsubo, Japan).

Choirodon azurio JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 14, No. 4, 1909, 194 (Formosa record).

Choerodon azurio JORDAN and HUBBS, Mem. Carnegie Mus., vol. 70, 1925, p. 249 (Osaka and Tokyo).

Labrus japonicus (not HOUTTUYN) VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1837, p. 72. Japan.—SCHLEGEL, Fauna Jap., Poiss., pts. 7–9, 1845, p. 163, pl. 85 (Nagasaki).

Choerops japonicus GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 96 (China).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Yokohama).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Luzon, Cavite, Santa Cruz).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 30 (Japan).

Depth 2½; head 3, width 2. Snout 2⅞; eye 4, 1⅓ in snout, 1⅙ in interorbital; maxillary reaches eye, 3⅕ in head; interorbital 3⅓, broadly convex; hind preopercle edge finely though obsoletely serrate. Gill rakers 9+8, lanceolate, short.

Scales in lateral line, 26+ 2; 4 scales above lateral line, 7 below, 6 predorsal; 5 rows across cheek. Scales with 16 to 18 basal radiating striae, apical 60 to 62, obsolete and feeble; circuli fine.

D. XIII, 7, 1, tenth spine 2⅔ in head, first ray 2⅓; A. III, 10, 1, third spine 3, first ray 2⅗; caudal 1⅖, truncate, concave behind as expanded; least depth of caudal peduncle, 2⅙; pectoral 1⅓; ventral 1⅘.

Brown above, whitish below. Back with some dull dusky shades behind head, at front of spinous dorsal and following pale oblique yellowish band below lateral line, also on middle of side of caudal peduncle. Broad deep dusky band from pectoral axil to bases of postero-median dorsal spines, followed posteriorly below lateral line by equally broad yellowish band. Deep dusky blotch at last dorsal spine and at first 2 dorsal spines medianly. Anal with tinge of pale dusky anteriorly. All fins otherwise pale to whitish with grayish on caudal medially behind. Iris pale yellowish. Traces of some grayish spots on soft dorsal and anal.

Japan, Formosa, China.

18857. Hongkong market. October 9, 1908. Length, 118 mm.
50240 U.S.N.M. Nagasaki. Jordan and Snyder. Length, 214 mm. 1 example.
59691 U.S.N.M. Hamashima, Japan. Dr. H. M. Smith. Length, 190 mm. 1 example.
71219 U.S.N.M. Shimizu, Japan. *Albatross* collection. Length, 95 to 114 mm. 2 examples.
71357 U.S.N.M. Shimizu. *Albatross* collection. Length, 96 to 119 mm. 2 examples.
71584 U.S.N.M. Kagoshima. *Albatross* collection. Length, 200 mm. 1 example.
71800 U.S.N.M. Misaki. *Albatross* collection. Length, 129 to 246 mm. 2 examples.

CHOERODON ANCHORAGO (Bloch)

Sparus anchorago Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 108, pl. 276. "Received from the Holland auction."

Choerops anchorago Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 95 (Amboina).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Singapore).—Day, Fishes of India, pt. 3, 1877, p. 391, pl. 83, fig. 5.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 238 (East Indies, North coast Australia, Pelew Islands, Yap).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Cebu and Manado).—Day, Fauna British India, vol. 2, 1889, p. 394, fig. 131.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Cebu).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 28 (Manila).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Bacon and Jolo).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 362 (Macassar, Gisser Island, Saleyer, Feer).—Ogilby, Commerc. Fish. Fisher., Queensland, 1915. (North Queensland.)

Cossyphus anchorago Troschel, Arch. Naturg., 1840, p. 279.

Choirodon anchorago Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 265 (Cuyo).

Choerodon anchorago Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Labrus macrodontus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 451, 522. No locality.—Cuvier, Hist. Nat. Poiss., vol., 13, 1839, p. 98 (Java).

Choerops macrodon Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 162, pl. 47, fig. 1 (Java, Bawean, Sumatra, Singapore, Bintang, Biliton, Celebes, Sumbawa, Ternate, Batjan, Ceram, Timor).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 94 (Hope Island North-east Australia).—Kner, Reise Novara, Fisch., vol. 2, 1865, p. 248 (Madras and Singapore).—

Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Cebu and Rubi, New Guinea).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 548 (C. de Cebu, Luzon, Batangas, Nasugbu).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).

Choerops macrodontus Weber, Abhandl. Senckenberg. Ges., vol. 34 (1), 1911, p. 8 (Kei Island).

Choerops meleagris Rüppell, Verz. Senckenberg. Mus. Fische, 1852, p. 20.

Labrus chlorodus Gray, Cat. Fish. Gronow, 1854, p. 80. Habitat?

Crenilabrus leucozona Bleeker, Nat. Tijds. Ned. Indie, vol. 15, 1858, p. 238. Biliton.

Choerops leucozona Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 163, pl. 44, fig. 4. (Biliton).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 95 (copied).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Cebu and Manado).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Cebu).

Labrus choirodon (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 162 (name in synonymy).

Choerops maeander Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 102. Cebu, Philippines.

Choerops meander Elera, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Cebu).

Choerops graphicus De Vis, Proc. Linn. Soc. New South Wales, vol. 9, 1885, p. 878. Cardwell, Queensland coast.

Depth 2⅖ to 2⅗; head 2½ to 2¾, width 2 to 2⅕. Snout 2$\frac{1}{10}$ to 4, compressed; eye 3 to 6⅓, 1½ to 3 in snout or greater than snout in young, 1 to 1⅔ in interorbital and little greater than interorbital in young; canines ¼, lower with each outermost curved out and slightly backward, upper with outer small, inconspicuous and directed backward; interorbital 3¾ to 4½, broadly convex. Gill rakers 5+9, short, robust, lanceolate.

Scales in lateral line 26 or 27+ 2 or 3, tubes arborescent; 3 scales above lateral line, 7 or 8 below, 7 or 8 predorsal. Scales with 14 to 22 basal radiating striae, apical 18 to 27; circuli very fine.

D. XIII, 7, 1, thirteenth spine 2⅔ to 3⅖ in head, sixth ray 2$\frac{1}{10}$ to 2¼; A. III, 9, 1, third spine 2¾ to 3⅞, first ray 2⅕ to 2⅓; caudal 1½ to 1⅗, nearly truncate, convex behind as expanded; least depth of caudal peduncle 1½ to 1⅗; pectoral 1⅙ to 1⅖; ventral 1⅗ to 1⅔.

Back and upper surface of head brown, with pale dots, thick-set over side of head usually and sometimes over back. Upper surface of caudal peduncle pale like lower surface, dark streak following along lateral line to caudal base. Under surface of head and breast pale, like belly. Along side medianly sometimes pale area of abdomen extends upward in variously narrowed angle or wedge to lateral line opposite last half of depressed pectoral fin. In small examples this may even appear as white wedge for a scale above lateral line. Pectoral base neutral dusky, fin pale like ventral. Last few rays of soft dorsal pale like upper surface of caudal peduncle and caudal fin. Anal pale.

East Indies, North Australia, and Micronesia to Yap and the Pelew Islands. The fin markings as shown in Bleeker's figure have apparently largely faded out.

7583, 8166. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 185 and 260 mm.
8113. Alimango Bay. March 5, 1909.
12401, 18473, 18474. Bolalo Bay, Palawan. December 21, 1908. 5 examples. Length, 72 to 143 mm.
7098. Busin Harbor, Burias Island. March 8, 1909. Length, 167 mm.
7840. Busin Harbor. April 22, 1908. Length, 240 mm.
5664. Busin Harbor. April 23, 1908. Length, 210 mm.
4855. Cagayan Island. March 31, 1909. Length, 260 mm.
7800. Candaraman Island, Balabac. January 4, 1909. Length, 210 mm.
13024. Cataingan Bay, near ship anchorage. April 17, 1908.
5540 and 16194. Cataingan Bay. April 18, 1908. Length, 144 to 210 mm.
5551. Cataingan Bay. April 19, 1908. Length, 240 mm.
7783 and 12574. Caxisigan Island, off Balabac. January 2, 1909. Length, 149 to 198 mm. [112.]
5343. Cebu market. April 4, 1908. Length, 153 mm.
6743 and 19121. Chase Head vicinity, beach village, Endeavor Strait. December 22, 1908. Length, 104 to 246 mm.
15465. Galera Bay, Mindoro. June 9, 1908. Length, 200 mm.
4928. Iloilo market. March 29, 1908. Length, 182 mm. General color largely olive, upper half of body darker, lower pearly blue, becoming grass green along base of anal and sides of peduncle; middle of scales of the dark area approaching slate; upper portion of head slaty olive, darkest on nose; region under middle of dorsal darkest, the dark continuing as a median stripe on the peduncle; upper portion of peduncle covered by a paler blotch; another palish, extending upward from middle of pectoral; sides of head and nuchal region and near base of dorsal, anteriorly with many scattered small orange brown spots; lower part of cheek pearly blue, limited from dark area by a brownish line from angle of mouth to lower base of pectoral, confluent with brown margin of slate centered ocellus which lies at base of pectoral; chin and throat pinkish buff; premaxillary with pale orange stripe; orange spot on lower jaw behind second canine. Dorsal body color; thickened tips of membranes slate blue with submarginal of orange brown; an irregular orange brown stripe just above the scales; soft dorsal yellowish posteriorly, dusky anteriorly, narrowly margined with slate, black and orange. Caudal dull greenish orange, tipped with narrow slate. Anal pale citron yellow, margined with slate and orange. Pectoral very pale orange, slate blue line at base above ocellus-like bar and axil dark. Ventral pale bluish green, first ray with orange stripe.
9255. Inamucan Bay, Mindanao. August 8, 1909.
4917. Jolo Island. March 7, 1908. Length, 174 mm.
5584. Jolo market, Jolo. February 8, 1908. Length, 182 mm.
11370. Jolo reefs. March 6, 1908. Length, 182 mm.
1 example, Jolo. March 6–7, 1908. Length, 115 mm.
5965, 5966, 9164. Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 175 to 287 mm.
6050. Little Santa Cruz. May 28, 1908. Length, 298 mm.
8446. Mactan Island, Cebu. March 25, 1909. Length, 215 mm.
15895. Mansalay, Mindoro. June 4, 1908. Length, 190 to 245 mm.
15967. Masbate reef. April 20, 1908. Length, 190 mm.
5499. Pangasinan Island. February 13, 1908. Length, 190 mm.

1 example, Philippines. Length, 185 mm.

6386 and 6387. Port Jamelo. July 13, 1908. Length, 243 to 250 mm.

14258. Port Palapag. June 3, 1909. Length, 188 mm.

4975. Ragay River. March 10, 1909. Length, 243 mm. Head light hooker green, becoming darker on the back; centers of scales smoky, with margin lighter; pale green on upper peduncle; middle of side washed with lemon yellow; chin pale yellow, subopercle bluish above; breast washed with chrome shading into greenish lavender on belly and becoming pale green below base of anal and on lower peduncle; middle of peduncle blackish along lateral line; sides of head, back and nuchal region covered by minute orange round dots; the maxillary with an ochraceous stripe; preorbital mottled with the same. Dorsal tipped with blue throughout; soft portion with dusky region anteriorly and ochraceous bars and spots across entire fin. Caudal olive green, tipped with orange and pale blue. Anal washed with citron yellow, edge pale blue, resting on bright orange; a broad band through center, spotted with round orange spots; a broken orange bar near the base. Ventral bluish green with orange stripes on the second to fourth membranes. Pectoral pale lemon yellow, the membranes hyaline; base crossed by indigo umber and indigo, umber continuing to gill-opening and clouding axil; a narrow dull ochraceous line divides light and dark areas of side of head. Pupil with orange reflections; iris concentrically orange and green; lid margined with orange.

5298 and 5300. Romblon. March 26, 1908. Length, 140 to 315 mm.

21061. Sablayan, Mindoro. December 12, 1908. Length, 155 mm.

5479. San Januico Strait. April 13, 1908. Length, 198 mm.

11897, 12014, 22066. San Miguel Harbor, Ticao Island. Length, 121 to 199 mm.

5015. South Tumindao, lagoon anchorage. February 26, 1908. Length, 225 mm.

4029 (Dr. 5105). Sueste Point Light, Luzon, Philippines. Length, 199 mm.

5815 and 5816. Tataibaga Point, Pujada Bay, Mindanao. May 15, 1908. Length, 195 to 248 mm.

6423 and 18955. Tilig, Lubang. July 14, 1908. Length, 170 to 190 mm.

6478. Tilig. July 15, 1908. Length, 250 mm.

7804 and 7805. Ulugan Bay, near Bahali River mouth. December 28, 1908. 3 examples. Length, 94 to 110 mm.

7703. Ulugan Bay, Rita Island. December 29, 1908.

6657. Varadero Bay, Mindoro. July 23, 1908. Length, 272 mm.

A1479. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 277 mm.

35717 U.S.N.M. Sadong, North Borneo. W. T. Hornaday. Length, 202 mm. 1 example.

56078 U.S.N.M. Bacon, Philippines. Philippine Commission. Length, 163 mm.

58030 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 170 to 263 mm. 2 examples.

48626 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 135 mm.

33254 A.N.S.P. Bacon. Bureau of Fisheries. Length, 150 mm.

CHOERODON ZAMBOANGAE (Seale and Bean)

Choerops zamboangae SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, November 21, 1907, p. 236, fig. 6. Zamboanga.

Depth 2⅖ to 2⅗; head 2⅗ to 3¾, width 2 to 2⅓. Snout 2¼ to 2⅓; eye 4½ to 5⅘, 1⅞ to 2⅓ in snout, 1⅖ to 1⅔ in interorbital;

maxillary not quite reaching eye, 3 to 3⅖ in head; interorbital 3½ to 3¾, convex. Gill rakers 9+12, short points.

Scales in lateral line 27 or 28+2; 3 or 4 scales above lateral line, 10 or 11 below, 7 or 8 predorsal; cheek scales in 10 rows. Scales with 25 to 29 basal radiating striae; 62 to 112 feeble apical striae; circuli very fine.

D. XII, 8, third spine 4¾ in head, seventh ray 2¾ to 3; A. III, 10, third spine 4¾ to 5½, eighth ray 2⅔ to 2⅘; caudal 1⅔, truncate; least depth of caudal peduncle 2¾ to 2⅘; pectoral 1⅓ to 1⅖; ventral 1¾ to 1⅘.

Back brown, sides and below little paler, but uniform. Brown horizontal streak at lower eye edge, extends back to preopercle and short brown bar forward from eye to nostrils, also small postocular brown spot. Iris pale yellowish. Below soft dorsal back slightly paler or same color as tail below, color at spinous dorsal not greatly contrasted. Spinous dorsal brown like back anteriorly; soft dorsal pale like tail below; upper edges of both dorsals little brownish, though fins without spots. Anal pale like belly, though with some pale gray submarginal ocelli, irregular and much faded. Other fins all pale brown.

57864 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 151 mm. Type.
61154 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 49 mm. Paratype.

CHOERODON MARGARITIFERUS, new species

Depth 3⅓; head 2⅗, width 2. Snout 3⅙; eye 5, 1⅘ in snout, 1⅖ in interorbital; maxillary reaches ¾ to eye, concealed, length 3⅗ in head; 4 front canines in each jaw, outer one each side flares backward; interorbital 3⅘ in head, slightly depressed, only little elevated. Gill rakers 6+10, lanceolate, rather stiff, inner edge with several flexible points, ⅓ of gill filaments, which 1⅖ in eye.

Scales 27+2 in lateral line, 4 above, 8 below, 7 predorsal; head scaly, 3 or 4 rows across cheek to angle of preopercle ridge; cheek scaleless anteriorly and on preopercle flange. Lateral line of simple, slender, well exposed tubes, complete. Scales with 13 or 14 basal radiating striae and apically about 45 parallel, obsolete circuli fine.

D. XII, 8, 1, spines stiff, last 4⅙ in head, fifth ray 4; A. III, 9, 1, last spine 5⅘, first ray 3⅞; least depth of caudal peduncle 3⅖; caudal 2, truncate, corners pointed; pectoral 1⅘; ventral $1\frac{3}{10}$.

Dull brown generally, paler to whitish below. Gray white line from snout tip to lower eye edge and on postocular broken as row of small white spots to white blotch in pectoral axil and white bar across pectoral base; also above on postocular another similar whitish streak, broken as spots or dots on opercle; they appear as if continued on upper front side of back far as depressed pectoral fin and those from pectoral axil back till above middle of anal base as

small white spot on each scale. Scales along dorsal bases and upper edge of caudal peduncle, also band along straight section of lateral line medially on caudal peduncle and caudal base, whitish. Iris yellowish, with whitish blotch above and on upper lid posteriorly. Dorsals and anals whitish.

Type.—Cat. No. 89966, U.S.N.M. Jolo market, Jolo. February 11, 1908. Length 135 mm. (5577 B. F.).

Apparently differs from all other species of the genus in its coloration.

(*Margaritiferus*, pearl bearer, with reference to its white spots.)

CHOERODON SCHOENLEINII (Valenciennes)

Cossyphus schoenleinii (Agassiz) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 143. Celebes.

Choerops schoenleini Bleeker, Atlas Ichth. Ind. Neérl., vol. 1, 1862, p. 163, pl. 46, fig. 3 (Java, Singapore, Celebes, Batjan).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang Sumatra).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 784, fig. 7 (Negros).

Cossyphus cyanostolus Richardson, Proc Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1846, p. 256. China Seas, Canton.

Cossyphus ommopterus Richardson, Proc. Brit. Assoc. Adv. Sci. (Ich. Chin. Japan), 1846, p. 257 (according to Günther same type as *Cossyphus cyanostolus*, Sea of China, Canton).

Choerops ommopterus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 94 (type; China, Molucca Sea, Cape York).—Steindachner, Sitz. Akad. Wiss. Wien, vol. 56 (1), 1867, p. 316 (Cape York).—Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 46 (south of New Guinea).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Luzon, Santa Cruz, Cavite).

Choerops unimaculatus Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1873, p. 102. Cavite.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Luzon, Santa Cruz, Cavite).

Depth 2⅖ to 2⅔; head 2½ to 3, width 1⅘ to 2⅖. Snout 1⅞ to 3, compressed; eye 4 to 7, 1⅓ to 4 in snout, 1 to 2 in interorbital; canines ¼, lower laterals flare out and little backward, upper lateral little smaller than anterior; interorbital 3½ to 4 in head, convex. Gill rakers 9+11, short, robust, lanceolate.

Scales in lateral line 26 or 27+2 or 3, tubes with fine contracted branchlets; 3 scales above lateral line, 8 or 9 below, 7 or 8 predorsal. Scales with 11 to 14 basal radiating striae and 2 to 5 marginals; 8 to 11 imperfect apicals; circuli fine.

D. XI or XII, 7, 1 or 8, 1, thirteenth spine 3⅕ to 4⅛ in head, fifth ray 2⅖ to 2⅞; A. III, 9, 1, third spine 2⅞ to 3½, eighth ray 2½ to 2⅞; caudal 1½ to 1⅔, truncate, slightly convex behind as expanded; least depth of caudal peduncle 2⅓ to 2⅗; pectoral 1¼ to 1⅖; ventral 1½ to 1⅔.

Largely dull brownish, little paler below. Large pale blotch below last rays of soft dorsal and on upper surface of caudal peduncle. Several pale or bluish white streaks about edge of orbit, also along edge of opercle. Pectoral base pale, with trace of blue cross-line.

East Indies, China, Queensland. Few of our examples show any traces of pale blue spots on the body as in Bleeker's figure. No trace now evident of blue line back from corner of mouth. Dark spot below last dorsal rays scarcely distinct.

There is little in Cartier's imperfect account of *Choerops unimaculatus* to distinguish it. He mentions that on the hind part of the back a blackish round blotch, extending from the twelfth dorsal spine to the first dorsal ray. His 2 examples were 51 and 57 mm. Also his name precludes the use of the same by De Vis in 1884 for a Barrier Reef specimen.

8324. Cataingan Port, Masbate. March 14, 1909. Length, 250 mm.
22661. Cataingan Bay, Masbate. April 18, 1908. Length, 73 mm. [574.]
5427. Cebu market. April 7, 1908. Length, 490 mm.
8408. Cebu market. March 19, 1909. Length, 283 mm.
1 example, Ragay River, Ragay Gulf. March 10, 1909. Length, 40 mm.
5925. Zamboanga. May 25, 1908. Length, 270 mm.
A 807. Zamboanga market. October 9, 1909. Length, 193 mm.
5997. Zamboanga. May 26, 1908. Length, 270 mm.
9390 to 9392. Zamboanga market. September 7, 1909. Length, 233 to 256 mm.
A 812. Zamboanga market. October 11, 1909. Length, 315 mm.
13238. Macassar market, Macassar Island, Dutch East Indies. December 24, 1909. Length, 192 mm.
6688. Hong Kong market, Hong Kong, China. August 13, 1908.
6849. Hong Kong market. October 22, 1909. Length, 288 mm.
19852 U.S.N.M. Philippines? Length, 52 mm.
51988 U.S.N.M. Negros. Dr. B. Dean. Length, 318 mm.
27703 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 220 mm.

CHOERODON MELANOSTIGMA, new species

Depth 2½ to 2¾; head 2⅔ to 3, width 1⅞ to 2. Snout 2⅖ to 2¾; eye 3⅘ to 4⅞, 1⅖ to 2 in snout, 1 to 1⅖ in interorbital; maxillary ¾ to ⅞ to eye, 3 to 3½ in head; canines ¼, outer lower flaring outward each side; inner faces of jaws inside mouth smooth and bony; interorbital convex, 3½ to 4 in head. Gill rakers 7 or 8 + 10 or 11, short, lanceolate.

Scales in lateral line 26 or 27 + 2, each tube with small branchlets; 4 scales above lateral line, 9 below, 6 or 7 predorsal; 5 or 6 rows of cheek scales. Scales with 18 to 25 basal radiating striæ, 3 auxiliaries; 75 to 108 obsolete or imperfect apical striæ; circuli fine.

D. XII, 8, 1, twelfth spine 2⅗ to 3 in head, first ray 2½ to 2⅗; A. III, 9, 1 or III, 10, 1, third spine 3 to 3⅖, first ray 2⅓ to 2¾; caudal 1¼ to 1⅓, slightly concave behind, little convex as expanded; least depth of caudal peduncle 2⅓ to 2⅔; pectoral 1⅛ to 1⅓; ventral 1½ to 1¾.

Pale brown generally. Pale gray line from below hind nostril to eye, another along lower eye edge back to preopercle edge; small gray spot close behind eye and another along upper hind eye edge. Deep

brown or blackish blotch from level with median axis of body obliquely up across lateral line to base of soft dorsal. Anterior to dark blotch, and posteriorly, pale yellowish tinge. Iris pale orange. Fins all pale, like body. In small example blue-gray spots less developed about eye.

Related to *Choerodon jordani* Snyder,[13] but differs in the coloration, as there is only a single dusky brown oblique band below the middle of the dorsals, with a yellow area in front and behind and the dark portion not extended above in the soft dorsal or behind on the caudal peduncle or upper caudal edge.

Type.—Cat. No. 89967, U.S.N.M.

5578 and 5579. Jolo market, Jolo. February 11, 1908. Length, 120 to 204 mm. Paratypes.

4859. Jolo market. February 12, 1908. Length, 208 mm. Type.

(μέλας, black; στιγμα, spot; with reference to the black blotch below the soft dorsal.)

MACROCHOERODON, new subgenus

Type.—Crenilabrus oligacanthus BLEEKER.

Differs from subgenus *Choerodon* in the long ventrals, reaching well beyond front of soft anal or equally long as, or longer, than the head. Body rather slender.

(μακρος, long, with reference to the long ventrals; *Choerodon*.)

CHOERODON OLIGACANTHUS (Bleeker)

Crenilabrus oligacanthus BLEEKER, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 489. Rio, East Indies.

Choerops oligacanthus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 164, pl. 47, fig. 2 (Singapore, Bintang, Banka, Celebes).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 96 (Singapore).—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 173 (Singapore).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Cebu and Manado).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 549 (Cebu).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 363 (Makassar).

Choirodon oligacanthus JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 265 (Iloilo).

Choerops palawanensis SEALE, Philip. Journ. Sci., vol. 4 (A), 1909, p. 523. Puerta Princesa, Palawan Island.

Depth 2¾ to 3; head 2⅘ to 3, width 2⅙ to 2½. Snout 2⅙ to 3⅔; eye 3⅔ to 6¼, 1 to 3 in snout, 1⅙ to 1⅕ in interorbital; maxillary ¾ to or quite reaching eye, 3⅖ to 3⅞ in head; interorbital 4¼ to 5 ⅕, convex. Gill rakers 7+9, short, lanceolate.

Scales in lateral line 25 or 26+2; 4 scales above lateral line, 8 below, 6 to 8 predorsal; 7 or 8 rows of cheek scales. Scales with 22 to 23 basal radiating striae; apical few obsolete imperfect radii; circuli very fine.

[13] Proc. U. S. Nat. Mus., vol. 35, 1909, p. 98. Okinawa, Riu Kiu Islands; Proc U. S. Nat. Mus., vol. 42, 1912, p. 506, pl. 65, fig. 2.

D. XIII, 7, 1 thirteenth spine 3¼ to 3⅓ in head, sixth ray 1⅘ to 2¼; A. III, 10, 1, third spine 3⅓ to 3½, ninth ray 1¾ to 2; caudal 1⅕ to 1¼, little concave, double concave as expanded; least depth of caudal peduncle 2⅓ to 2⅖; pectoral 1⅕ to 1¼; ventral 2⅗ to 3 in combined head and trunk.

Largely dull brownish, little paler on under surface of body. From level with lateral line traces of 9 or 10 blue longitudinal lines. Close above lateral line, opposite middle of spinous dorsal, whitish or pale blotch and its lower border broadly blackish. Traces of 3 blue lines from eye to maxillary. Dusky blotch usually above lateral line at front of caudal peduncle. Vertical fins pale brownish, variegated with blue lines. Paired fins pale, front ventral membrane grayish blue.

East Indies, Philippines. Easily known by the 2 pale or whitish transverse lines across sides of mandible and long ventrals. Young show black blotch above pectoral terminally and another at front of caudal peduncle above, also traces of 5 or 6 broad ill-defined brownish tarnsverse bands.

21758. Cebu market. March 20, 1909. Length, 57 to 197 mm. 3 examples [1403.] Greenish above, from below middle of side, with orange stripes between scale rows, intervals along rows more or less lavender; chin barred with orange and stripes of same across lower limb of opercle and about base of pectoral; sulphur spot in middle of side just above lateral line. Dorsal olivaceous, with orange bars and reticulations. Caudal greenish. Anal similar to dorsal but paler. Ventrals with orange stripe through front. Pectorals without markings.

2 examples, Cebu market. March 28, 1909. Length, 59 to 65 mm.

5357. Cebu market. April 5, 1908. Length, 233 mm.

6107 to 6109. Cebu market. August 12, 1909. Length, 162 to 210 mm.

6957 and 13988. Iloilo market. May 31, 1908. Length, 153 to 180 mm.

20619. Sirinao Island, Nakoda Bay. December 30, 1908. Length, 133 mm.

7809. Ulugan Bay, near mouth of Baheli River. December 28, 1908. Length. 180 mm.

7666. Ulugan Bay. Length, 255 mm.

5054 and 5056. Sandakan Bay, Borneo. February 29, 1908.

19991, 20377 to 20380. Sandakan Bay. March 2, 1908. Length, 88 to 151 mm.

5286. Sandakan Bay. March 21, 1908. Length, 113 mm.

Genus LEPIDAPLOIS Gill

Lepidaplois Gill, Proc. Acad. Nat. Sci. Phila., 1862, p. 140. Type *Labrus axillaris* Bennett, monotypic.

Euhypsocara Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 222. Type *Cossyphus anthioides* Günther, monotypic.

Gymnopropoma Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 222. Type *Labrus bilunulatus* Lacépède, monotypic.

Verreo Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 619. Type *Cossyphus oxycephalus* Bleeker, monotypic.

Verriculus Jordan and Evermann, Bull. U. S. Fish. Comm., vol. 22, 1902 (1903), p. 191. Type *Verriculus sanguineus* Jordan and Evermann, monotypic.

Body oblong, compressed. Snout pointed. Mouth large. Lateral teeth uniserial, coalescent at base. Canines $\frac{4}{4}$ anteriorly; hind canine each side. Preopercle usually finely serrated. Scales 30 to 35 in lateral line. Cheeks and opercles with imbricated scales. Dorsals and anals, also caudal, scaled basally. Lateral line complete. Dorsal spines 12, rays 10. Anal spines 3, rays 12.

Indo-Pacific. Tropical shore or reef fishes, brilliant, of moderate or large size.

In this connection we have examined the type of *Lepidaplois mirabilis* Snyder (Proc. U. S. Nat. Mus., vol. 35, 1909, p. 96, Riu Kiu; idem, vol. 42, 1912, p. 506, pl. 66, fig. 1). It is Cat. No. 62234, U. S. N. M., and 190 mm. long. We believe it represents a subgenus allied with the subgenus *Lepidaplois*.

LIENARDELLA, new subgenus

Type.—*Lepidaplois mirabilis* Snyder.[14]

Head blunt, with rather abrupt snout, so the muzzle not protruding. Scales on head large, about 5 rows on cheek and none on preopercle flange. Body with dark and light alternating transverse bands.

(For Elizé Liénard, author of several early papers on the fishes of Mauritius.)

ANALYSIS OF THE SPECIES

*a*¹. LEPIDAPLOIS. Preopercle limb scaly.

*b*¹. Black band from pectoral axil to last dorsal spines and first dorsal rays; black blotch at pectoral base ..... **mesothorax.**

*b*². No black oblique lateral band; 3 yellow spots along back above lateral line; black blotches on ventral and anal ..... **diana.**

*a*². GYMNOPROPOMA. Preopercle limb scaleless.

*c*¹. Red, with many yellow spots on predorsal; yellow cross-bar on side of back ..... **perditio.**

*c*². Yellow, with red or brown longitudinal lines or streaks on head and body; black blotch on soft dorsal basally, extending on back or below soft dorsal.

*d*¹. Anal edge white; ventral pale ..... **bilunulatus.**

*d*². Anal edge black; ventral black ..... **hirsutus.**

LEPIDAPLOIS MESOTHORAX (Schneider)

Labrus mesothorax SCHNEIDER, Syst. Ichth. Bloch, 1801, p. 254. East Indies.

Cossyphus mesothorax VALENCIENNES, Hist. Nat. Poiss, vol. 13, 1839, p. 129 (Java).—BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, pl. 38, fig. 4.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 103 (Ceram and Amboina).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina River).

Cossyphus mesotyorax BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 159 (Java, Sumatra, Amboina).

---

[14] The type species greatly suggests *Cossyphus octomaculatus* (LIÉNARD) SAUVAGE, Hist. Nat. Madagascar, Poiss., vol. 16, 1891, p. 454 (based on *Cossyphe à 8 taches* LIÉNARD, Douz. Triez. Rap. Soc. Hist. Nat. Maurice, 1843, p. 77), from Mauritius).

Lepidaplois mesothorax Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).—Ogilby, Mem. Queensland Mus., vol. 5, 1916, p. 184 (Barrier Reef).

Crenilabrus elegans (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 130. Batavia (name in text).

Scarus mordax Gray, Cat. Fish. Brit. Mus. Gronow, vol. 2, 1854, p. 64. Indian Sea.

Depth 2⅔ to 3; head 2¾ to 3, width 2 to 2⅕. Snout 3 to 3$\frac{1}{10}$; eye 4½ to 5¼, 1⅔ to 1⅘ in snout, 1⅕ to 1¾ in interorbital; maxillary reaches eye or slightly beyond front eye edge, 2¾ to 3 in head; strong conic canine each side above directed forward; interorbital 3⅓ to 3¾, convex. Gill rakers 6+11, lanceolate, short.

Scales in lateral line 29 to 32+2 or 3; 5 scales above lateral line, 11 below, 31 to 34 predorsal. Scales with 23 to 27 basal radiating striae; apically 3 or 4 weak imperfect striae; circuli very fine.

D. XII, 9, 1 or 10, 1, twelfth spine 2 to 2$\frac{1}{10}$ in head, first ray 1⅘ to 2; A. III, 12, third spine 1⅘ to 2, first ray 1¾ to 1⅘; caudal 1⅙ to 1¼, truncate, little convex behind as expanded; least depth of caudal peduncle 1⅞ to 2; pectoral 1¼ to 1⅖; ventral 1⅔ to 1⅗.

Upper surface of head and front of back deep sepia; on head dark color bounded below by blackish band from above end of maxillary back to preopercle angle; on back color bounded sharply behind by oblique black band, usually from last dorsal spines so that most of dorsal fin usually dark to pectoral axil. Otherwise body pale yellowish.

East Indian region, Queensland. Variation is noticeable in that the black dorsal band may sometimes begin at the middle of the spinous dorsal and it seldom extends back to the front edge of the soft dorsal. In all our examples at least the membranes and spines of spinous dorsal medianly are terminally blackish, only greenish yellow basally and not entirely yellowish as shown in Bleeker's figure. None of our examples have the lower side of the head dark below the rictal streaks as Bleeker shows.

7685. Agojo Point, Catanduanes Island. June 10, 1909. Length, 152 mm.
4963. Alibijaban Island. March 6, 1909. Length, 145 mm.
13501 and 14894. Alimango Bay, Burias Island. March 5, 1909. Length, 164 to 171 mm.
1 example, Burias Island. March 5, 1909. Length, 148 mm.
7256. Busbus Point, Siasi Island. September 20, 1909. Length, 136 mm.
18723. Butauanan Island. June 13, 1909. Length, 147 mm.
9214. Camp Overton, Mindanao. August 6, 1909. Length, 158 mm.
10977 and 15056. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 166 to 184 mm.
15073. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 112 mm.
6891. Danawan Island and Si Amil Island. September 26, 1909. Length, 128 mm.
16643. Galera Bay, Mindoro. June 9, 1908. Length, 118 mm.

4671. Galvaney Island, Ragay Gulf. March 9, 1906. Length, 167 mm.
4641. Grande Island reef, Subig Bay. January 8, 1908.
13343. Langao Point, Luzon. June 24, 1909. Length, 190 mm.
9442. Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 150 mm.
8912. Mabul Island. September 29, 1909. Length, 140 mm.
12145. Masamat Bay, Quinalasag Island. June 12, 1909. Length, 152 mm.
5556. Masbate Reef, Masbate Island. April 20, 1908. Length, 148 mm.
14695. Matnog Bay. March 31, 1909. Length, 153 mm.
17453. Murcielagos Bay, Mindanao. August 9, 1909. Length, 130 mm.
20564. Opol, Mindanao Island. August 4, 1909. Length, 175 mm.
15255. Palag Bay vicinity, Luzon. June 16, 1909. Length, 109 mm.
13112. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 131 mm.
17623. Port Langcan, Palawan Island. April 8, 1909. Length, 158 mm.
5672. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 162 mm.
10749 and 18974. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 136 to 144 mm.
17600. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 168 mm.
7654. San Roque, Leyte. July 29, 1909. Length, 167 mm.
19101. Silino Island. August 10, 1909. Length, 148 mm.
4663 and 4664. Tambul Sigambul, Tonquil Island. September 14, 1909.
7920. Tutu Bay, Jolo Island. September 19, 1909. Length, 145 mm.
17716. Varadero Bay, Mindoro. July 23, 1908. Length, 165 mm.
13527. Uki, Bouro Island. December 9, 1909. Length, 170 mm.
7211. Limbe Strait, Celebes. November 9, 1909. Length, 142 mm.
17992. Limbe Strait, Celebes. November 10, 1909. Length, 156 mm.
21449. Una Una Road, Binang Unang, Celebes. November 17, 1909. Length, 124 mm.
13635. Una Una Road. November 18, 1909. Length, 148 mm.
1 example, Gane Road, Gillolo Island. December 1, 1909. Length, 105 mm.
20633. Kowloon market, China. September 26, 1908. Length, 125 mm.
12939. Tidore Island, south of Ternate. November 25, 1909. Length, 148 mm.
56025 U.S.N.M. Luzon. Philippine Commission. Length, 130 mm.

LEPIDAPLOIS DIANA (Lacépède)

Labrus diana Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 450, 452, pl. 32, fig. 1. Great Equatorial Ocean.

Cossyphus diana Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 127 (drawing by Delisse).—Peters, Arch. Naturges., 1855, p. 261 (Mozambique).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 159, pl. 38, fig. 1 (Sumatra, Bintang, Celebes, Batjan, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 104 (Mauritius and Amboina).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.—Günther, Fishes of Zanzibar, 1866, p. 87 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 549 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 392, pl. 87, fig. 3 (Waltair and Malay Archipelago); Fauna British India, vol. 2, 1889, p. 346.—Weber, Siboga Exp., vol, 57 Fische, 1913, p. 362 (Banda).

Lepidaplois diana Fowler, Proc. Acad. Nat. Sci. Phila., 1925, p. 258 (Natal coast).

Depth 3 to 3⅛; head 2⅜ to 2¾, width 2⅖ to 2⅗. Snout 2⅙ to 2¾; eye 5 to 6, 2 to 2⅞ in snout, 1 to 1⅛ in interorbital; maxillary reaches ⅘ to ⅞ to eye, 2 to 2⅞ in head; canines ⅔; teeth in jaws

with broad osseous pavement or dentary area along each side, lateral teeth but little distinct; interorbital broadly convex, 4 to 5 in head; preopercle edge very feebly or minutely serrated, but with appearance entire. Gill rakers 6+12, lanceolate, short.

Scales in lateral line 29 or 30+2; 4 scales above lateral line, 10 below, 15 or 16 predorsal. Scales with 21 to 25 basal striae, apical 4 to 6; circuli fine.

D. XII, 10, 1, twelfth spine 3 to 3⅗ in head, seventh ray 2⅖ to 2½; A. III, 12, 1, third spine 2⅛ to 2⅘, second ray 2⅛ to 2⅞; caudal 1½ to 1⅗, truncate behind; least depth of caudal peduncle 2⅓ to 2½; pectoral 1⅗ to 1⅞; ventral 2⅛ to 2⅙.

Largely tawny olive, head and back anteriorly with smutty tinge. Along bases of dorsals above lateral line 3 small, pale rounded spots and sometimes two each side of predorsal. Scales below soft dorsal and on caudal peduncle above lateral line each with terminal dusky brown spot. First and sometimes second membrances of spinous dorsal dusky. Front of soft dorsal with one or several small black spots and one at bases of last dorsal rays. Caudal with rounded black basal spot. Anal with two black blotches, anterior larger. Ventral with large black median blotch. Iris pale brown.

Red Sea, Zanzibar, Mauritius, Natal, East Indies.

13516. Gomomo Island. December 3, 1909. Length, 151 mm.

12496. Northwest Verde Island. July 22, 1908. Length, 160 mm.

11505. Sulade Island. September 17, 1909. Length, 178 mm. [1945.] Olive above anteriorly, fading to pale silvery gray, with pink wash anteriorly; lower head and breast somewhat slaty; along back two or three rows of scales under dorsal series of three sulphur yellow spots occupying area of one or two scales each; first under fifth dorsal spine, second between tenth and eleventh and last under middle of base of soft dorsal; fourth spot occupies center of upper part of peduncle in median line; clustered under base of soft dorsal and along upper part of peduncle numerous black spots, occurring on tips of scales mainly. Dorsal spines and membranes blood red, color continuing on first two soft rays, membranes of remaining fin hyaline with slight pink shade, rays paler red. Caudal similar to posterior soft dorsal; black spot at its base at end of lateral line. Anal reddish, with yellowish blotch in its center, large black one on front of soft rays just below margin and smaller black blotch in axil. Ventrals with yellowish shade, broad black bar somewhat distal to center occupying most of upper surfaces of fin. Pectoral rays pink, membranes hyaline; base of pectorals may have been orange in life. Iris brassy, with dash of blue on hinder part.

16038. Sulade Island. September 18, 1909. Length, 181 mm.

12370. Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 165 mm. [266.] Dull red, the color appearing mostly as vertical lines at bases of scales; upper part of head and back anteriorly almost solid red; lower sides with gray ground and golden behind the red of scales; the back posteriorly and on peduncle peppered with black dots; lips pale. Spinous dorsal red, brighter than body color; membranes yellowish edged with black on the incised portion. Soft dorsal red, the posterior membranes hyaline; a black blotch on the anterior upper half and another at axil. Caudal almost crimson with a small black

blotch in the center of its base. Anal yellowish vermilion, a large black blotch on the anterior upper half of the soft portion, and another at axil. Ventrals yellowish, crossed by a broad black bar through middle; front edge pink. Pectoral pink, with yellow on base. Iris red with purple and golden shades behind.

13528. Uki, Bouro Island, Dutch East Indies. December 9, 1909. Length, 178 mm. [2120.] Similar in pattern to Bleeker's plate; anterior colors more purplish, light spots of back bright olive fading to very pale green; vertical fins with brighter reds, none of the yellow shown in plate; spinous dorsal membranes darker than shown, almost same as adjacent body color, front of spines more dark, tip of first membrane nearly black.

[2069.] Tidore Island, south of Ternate. November 25, 1909. Length, 120 mm.

LEPIDAPLOIS PERDITIO (Quoy and Gaimard)

Labrus perditio Quoy and Gaimard, Voy. Astrolabe, Zool., 1834, p. 702, pl. 20, fig. 4. Tongatabu.

Cossyphus perditio Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 125 (on Quoy and Gaimard).

Lepidaplois perditio Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 618, fig. 2 (near Wakanoura, Japan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 506 (Okinawa).—Ogilby, Mem. Queensland Mus., vol. 5, 1916, p. 184 (off Moreton Bay).

Cossyphus atrolumbus Valenciennes, Hist. Nat. Poiss, vol. 13, 1839, p. 123. Mauritius.—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 105 (Mauritius; Minerva Reef between Queensland and New Caledonia and Saumarez Reefs in Coral Sea; Aneiteum).—Günther, Fishes of Zanzibar, 1866, p. 87 (Zanzibar).—Steindachner, Sitz. Akad. Wiss. Wien, vol. 57 (1), 1868, p. 997 (Mauritius).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 241 (Mauritius, Zanzibar, Minerva Reef, Tongatabu, Aneiteum).

Depth 2½; head 2⅘, width 2. Snout 2½; eye 7½, 2⅘ in snout, 2 in interorbital; maxillary nearly reaches opposite front eye edge, length 2¾ in head; front canines ⅘; teeth in jaws with broad semimolar dentary areas along each side and only several lower posterior ones slightly larger; interorbital broadly convex, 3⅞ in head; preopercle edge entire. Gill rakers 8+13, short lanceolate points.

Scales in lateral line 31+2; 6 scales above lateral line, 12 below, 17 predorsal. Cheek with 8 rows of scales to preopercle ridge, flange naked. Tubes in lateral line simple. Scales with 23 basal radiating striae; 10 obsoletely apical; circuli fine.

D. XIII, 10, 1, twelfth spine 3½ in head, first ray 2⅘; A. III, 12, 1, third spine 3⅔, first ray 2⅞; caudal nearly long as head, emarginate, median rays forming slight convexity behind and upper and lower rays exserted points; least depth of caudal peduncle 2$\frac{1}{10}$; pectoral 1½; ventral, 1⅘.

Generally pale brown, head slightly darker and with thick-set obscure, small pale orange spots, more distinct on front. On back, close behind end of pectoral pale yellowish blotch of about 3 scales width and

extending little below lateral line. Behind this scales all with more or less basal deep brown streak or blotch, though less conspicuously on upper edge of caudal base. Spinous dorsal anteriorly, or for first four spines, neutral slate. Fins otherwise all pale brown.

Mauritius, Zanzibar, Queensland, Riu Kiu, Melanesia. It has not yet been reported from India or the East Indian region.

A. 1609. Nafa market, Riu Kiu Islands. February 7, 1910. Length, 522 mm.
71655. U.S.N.M. Nafa. *Albatross* collection. Length, 187 to 207 mm. 2 examples.

LEPIDAPLOIS BILUNULATUS (Lacépède)

Labrus bilunulatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 454, 526, pl. 31, fig. 2. Great Equatorial Ocean (Indo-Pacific).

Cossyphus bilunulatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 121 (Mauritius).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1862, p. 101, pl. 38, fig. 3 (Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 105 (Mauritius).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.—Günther, Fishes of Zanzibar, 1866, p. 87 (Zanzibar); Cruise of Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 240, pl. 130 (Mauritius, Zanzibar, Amboina, Misol, Hawaiian Islands).—Day, Fishes of India, Suppl., 1888, p. 802 (Ceylon); Fauna British India, vol. 2, 1889, p. 396.

Lepidaplois bilunulatus Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).

Cossyphus albotaeniatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 141. Hawaiian Islands.

Lepidaplois albotaeniatus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 278 (Honolulu and Hilo).

Lepidaplois strophodes Jordan and Evermann, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 190. Honolulu.

Lepidaplois richardsoni Fowler, Proc. Acad. Nat. Sci. Phila., 1907, p. 434, fig. 7. "Victoria, Australia" [probably really from the South Seas?].

Depth 2⅞ to 3; head 2¾ to 2⅞, width 2⅕ to 2¼. Snout 3; eye 5¾ to 6, 1⅞ to 2 in snout, 1⅗ to 1¾ in interorbital; maxillary reaches pupil, 2½ to 2⅔ in head; interorbital 3⅘ to 4, broadly convex. Gill rakers 6+12, lanceolate, short.

Scales 28 to 30 in lateral line, each tube with few short branchlets; 6 scales above lateral line, 10 to 12 below, 14 or 15 predorsal. Scales with 12 to 20 basal radiating striae and 4 or 5 marginals; 4 to 7 obsolete apical striae; circuli fine.

D. XII, 9, 1 or 10, 1, twelfth spine 3¼ to 3½ in head, seventh ray 2¼ to 2½; A. III, 12, 1, third spine 3¾ to 4½, eleventh ray 2⅘ to 2⅞; caudal 1⅛ to 1⅓, emarginate, little convex behind when expanded and upper and lower rays exserted; least depth of caudal peduncle 2⅕ to 2¼; pectoral 1½ to 1⅗; ventral 1⅓ to 1½.

Uniform pale brown generally, each row of scales on trunk and tail with median grayish or whitish streak or narrow band and on

belly and breast broken as grayish spots. Along side of snout to eye slightly darker brown shade than general color of head and this continued beyond eye to suprascapula; also from maxillary angle darker ill-defined band back across preopercle angle to interopercle. Front of spinous dorsal over most of first 3 membranes blackish brown. Below last dorsal rays and on upper surface of caudal peduncle for 3 or 4 scales in extent down to lateral line and below 1 or 2 scales, blackish brown blotch. Outer ventral edge slightly darker.

Mauritius, Zanzibar, Ceylon, East Indies, Hawaii. Our examples all agree with Bleeker's figure. The markings on the head, though similar, are less conspicuous. Compared with the Hawaiian examples, all of which show the dark posterior blotch above the lateral line and dark lines extending longitudinally down to the tip of the snout, besides 3 back from the eye and only narrow one from rictus backward, there is little of specific distinction.

A. 806. Zamboanga market. October 6, 1909. Length, 393 mm.
A. 813. Zamboanga market. October 11, 1909. Length, 295 mm.
5994. Zamboanga market. May 26, 1908. Length, 305 mm.
51037 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 220 mm.
50672 U.S.N.M. Honolulu. Bureau of Fisheries. Type of *Lepidaplois strophodes*.
55052 U.S.N.M. Honolulu. *Albatross* collection. Length, 170 mm.
55509 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 118 mm.
57914 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 240 to 252 mm. 2 examples.
84087 U.S.N.M. Hawaiian Islands. Length, 120 mm.
33125 A.N.S.P. Victoria, Australia. Mrs. Agnes Kenyon. Type of *Lepidaplois richardsoni*.

LEPIDAPLOIS HIRSUTUS (Lacépède)

Labrus hirsutus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 429, 473, pl. 20, fig. 1. Great Gulf of India.

Labrus rubrolineatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 433, 480. Madagascar and Reunion.

Labrus macrourus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 438, 493, pl. 9, fig. 3. Great Equatorial Ocean.

Cossyphus macrurus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 104 (Mauritius and types of *Labrus spilonotus*).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 240, pl. 119, fig. A. (Mauritius and Vavau).—Ishikawa and Matsuura, Prelim. Cat. Fish. Imp. Mus. Tokyo, 1897, p. 30 (Japan).—Gilchrist and Thompson, Ann. S. Af. Mus., vol. 11, pt. 2, 1911, p. 46 (Natal).

Lepidaplois macrurus Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 29 (Manila).

Crenilabrus croceus Lesson, Mem. Soc. Hist. Nat. Paris, vol. 4, 1828, p. 407. Tombau Bay, Mauritius.

Crenilabrus chabrolii Lesson, Voy. Coquille, Zool., vol. 2 (1), 1830, p 133, pl. 38 (on *Crenilabrus croceus*).

Labrus spilonotus Bennett, Proc. Zool. Soc. London, vol. 3, 1835, p. 207. Mauritius.

Cossyphus maldat VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 114. Mauritius.—GUICHENOT, Notes I. Reunion, vol. 2, 1862, p. 28.

Lepidaplois loxozonus SNYDER, Proc. U. S. Nat. Mus., vol. 35, 1909, p. 94. Okinawa, Riu Kiu; vol. 42, 1912, p. 506 (name).

Lepidaplois trotteri FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 63, 1923, p. 20. Paumotu Islands.

Depth 2½ to 2⅗; head 2¾, width 2⅛ to 2¼. Snout 2¾ to 2⅞; eye 5⅓ to 5¾, 2 to 2⅙ in snout, 1⅔ to 1⅘ in interorbital; maxillary reaches ⅞ to eye, 2⅖ to 2⅔ in head; canines ¼ anteriorly, and also small upper posterior one, each concealed in lips; broad bony dental plate inside each row of jaw teeth, which uniserial, small, very obtuse and short; interorbital 3¼ to 3½ in head, convex. Gill rakers 5+11, lanceolate, short, robust.

Scales in lateral line 30 to 33+2 or 3; 6 scales above lateral line, 11 below, 15 to 18 predorsal. Scales with 14 to 17 basal radiating striae; apical and marginal radiating striae 13 to 16, though of marginals 2 to 4 closer to basal striae; circuli very fine.

D. XII, 10, 1, twelfth spine 3⅞ to 4 in head, eighth ray 2½ to 2⅗; A. III, 12, 1, third spine 3⅘, tenth ray 2⅖ to 2⅗; caudal 1⅕ to 1¼, truncate, each end exserted little; least depth of caudal peduncle 2⅛ to 2⅙; pectoral 1⅔ to 1¾; ventral 1¼ to 1½.

Brown generally, under surface paler. Along each row of scales darker median band, continued forward on head a little darker and so 3 reach hind eye edge. First 2 or 3 membranes of spinous dorsal black. Base of soft dorsal black, streaked down and backward all along lower edge of caudal peduncle and lower edge of caudal fin. Lower marginal half of anal or more, black. Ventral black. Fins otherwise pale or unicolor.

Mauritius, Natal, Philippines, Riu Kiu, Paumotu. This species is very close to *Lepidaplois bilunulatus*, differing only in the black posterior blotch being extended downward and backward along the entire lower caudal edge. It is, however, very variable, as all the various synonyms here united will show.

Slight variation is noticeable in the specimens below. The black anal border not completely extending to the tip of the last anal ray in some cases. Also some with whole lower edge of breast and belly dusky.

The earliest name for the species appears to be *Labrus hirsutus* Lacépède. *Sparus forsteri* Schneider [15] has also been associated, but is apparently a *Symphorus*.

7286. Paluan Bay, Mindoro. December 11, 1908. Length, 230 mm.
6351. Port Jamelo. July 13, 1908. Length, 234 mm.
6918. Santo Domingo, Batan. November 7, 1908. Length, 285 mm.
74580 U.S.N.M. Nafa, Okinawa, Rui Kiu. *Albatross* collection. Type of *Lepidaplois loxozonus*. Length, 315 mm.

[15] Syst. Ichth. Bloch, 1801, p. 282. Tongatabu.

62233 U.S.N.M. Nafa. *Albatross* collection. Paratype of *Lepidaplois loxozonus*. Length, 107 mm.

82970 U.S.N.M. Paumotu Islands. Wilkes expedition. Type of *Lepidaplois trotteri*.

Genus PSEUDODAX Bleeker

Pseudodax Bleeker, Proc. Zool. Soc. London (December 10), 1861, p. 409. Type *Odax moluccanus* Valenciennes, orthotypic.

Body oblong, compressed. Each jaw with 2 pairs of broad incisors with cutting lateral edge. Preopercle edge entire. Branchiostegals 6. Scales moderate, 32 or 33 in lateral line, which continuous. Head scaly and cheek covered with small scales. Dorsal spines 11, rays 12. Anal spines 3, rays 14.

Indian Ocean and East Indian region. Only the single species described below. In a superficial way it is greatly suggestive of some species of *Anampses*, but is easily distinguished among all members of the family by its remarkable broad incisor-like teeth.

PSEUDODAX MOLUCCANUS (Valenciennes)

Odax moluccanus Valenciennes, Hist. Nat. Poiss., vol. 14, 1840, p. 305, pl. 408, fig. 2. Moluccas; Règne An. Cuv. Ill. Poiss., 1839, pl. 91, fig. 3.

Pseudodax moluccanus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 80, pl. 22, fig. 6, and pl. 18, fig. 5 (Celebes, Amboina, Ceram).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.—Bleeker, Verslag. Ak. Wet. Amsterdam, vol. 15, 1863, p. 20 (Hitu, Amboina); Nat. Tijds. Dierk., vol. 1, 1863, p. 263 (Atapupu, Timor).—Guichenot, Mém. Soc. Sci. Nat. Cherbourg, vol. 11, 1866, p. 67 (type, Reunion).—Day, Fishes of India, pt. 3, 1877, p. 409, pl. 89, fig. 1 (Malay Archipelago); Fauna British India, vol. 2, 1889, p. 420, fig. 146.

Pseudodax moluccensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 208 (Amboyna, Java); Fishes of Zanzibar, 1866, p. 102 (Zanzibar).

Odax moluccensis Cartier, Verh. Phys. Med. Ges. Würzburg, 1873, p. 106 (Bohol).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 557 (Bohol, Cebu).

Depth 2⅔ to 2⅗; head 3 to 3⅛, width 2⅖ to 2½. Snout 2¼ to 2½; eye 6 to 6⅔, 2¼ to 2⅜ in snout, 1½ in interorbital; maxillary reaches ⅘ to eye, 3⅛ to 3⅓ in head; interorbital 4¼ to 4⅖, convex. Gill rakers 5+9, short, fleshy, tubercles, spinescent, with about 5 spines to each.

Scales in lateral line 29+2 or 3; 4 scales above lateral line, 10 or 11 below, 10 to 12 predorsal. Scales with 20 basal radiating striae, apically with fine, obsolete, imperfect striae; circuli fine.

D. XI, 12, 1, eleventh spine 3⅘ to 4⅖ in head, first ray 3⅛ to 4¼; A. II, 11, 1, second spine 6 to 7, first ray 3⅓ to 3⅔; caudal 1⅔ to 1½, hind edge slightly convex; least depth of caudal peduncle 1⅞ to 2; pectoral 1⅔; ventral 1½ to 1⅗.

Dark brown generally, each scale with slightly darker median blotch. Scales on opercle each with dark blotch. Iris brown. Fins all brown, mostly more or less dusky terminally. Dorsals and anals

with submarginal dusky lines and reticulating dark lines over greater median or outer areas. Caudal base with transverse pale band, outer half with dark spots or bars. Pectoral olive, basally blackish. Ventral with dusky rays, membranes transparent.

Zanzibar and Reunion to the East Indies.

5320. Cebu market. April 4, 1908. Length, 206 mm.
5394. Cebu market. April 7, 1008. Length, 234 mm.
8431. Cebu market. March 24, 1909. Length, 249 mm.
6540. Off Daet, from line fisherman. June 15, 1909. Length, 233 mm.
A1201 and A1202. Doworra Island. December 2, 1909. Length, 248 to 263 mm.
6593. Maricaban Island, near Depoc Point. July 21, 1908. Length, 198 mm.
19190. Tulnalutan Island. September 9, 1909. Length, 202 mm. [1918.]
12864. Tifu Bay, Bouro Island. December 10. 1919. Length, 190 mm.
13491. Uki River, Bouro Island. December 9, 1909. Length, 193 mm.
A1189. Gane Road, Gillolo Island. December 1, 1909. Length, 256 mm.
13615. Una Una Road, Binang Unang Island, Gulf of Tomini, Celebes. November 18, 1909. Length, 177 mm. [2048.] Dark vermilion on nape and along base of dorsal, covering most of opercle; side and posterior part of body largely olive vermilion, scales with red brown spot at base, these more or less bar-like anteriorly and above, becoming circular below and on peduncle, continued on side of breast and belly. Head dark olivaceous; bright blue line from snout above premaxillary downward along lower cheek; opercle edged with bluish; about four obscure indigo stripes from snout backward through interorbital region; teeth bluish at base; lower lip and chin dusky carmine; upper lip dusky orange. Dorsal ground-color vermilion, margined with Prussian blue, body of fin mottled and streaked with dark. Anal more olive toward margin, rays reddish, edge of fin blue; two bars of dark blue through body of fin, one at about inner third, second composed of oblique dashes through outer half. Caudal nearly black, tipped with white and more or less shaded with blue. Ventrals blue in front, rays otherwise blackish. Pectoral first short ray blue above, others yellow; membranes hyaline; base of fin very dark.

WETMORELLA, new genus

Type.—*Wetmorella philippina*, new species.

Distinguished from all known labroids by the presence of a single large scale entirely covering the cheek.

This genus is unique in its large cheek scale, though in superficial resemblance greatly suggests the young of *Epibulus*.

(For Dr. Alexander Wetmore, assistant secretary, United States National Museum, in slight appreciation of his interest in our work on Philippine ichthyology.)

WETMORELLA PHILIPPINA, new species

Depth 2½ to 2¾; head 2⅗ to 2⅞, width 2⅛ to 2⅙. Snout 3⅖ to 3½; eye 3½ to 4, 1 to 1⅛ in snout, 1 or more in interorbital; maxillary reaches ¾ to ⅘ to eye, 4 to 4⅔ in head; lips narrow; interorbital 3¾ to 4⅛, broadly convex. Gill rakers 5+8, short rudiments.

Scales in lateral line 13 to 15+5 or 6+2 or 3; 2 scales above lateral line, 6 below, 7 to 10 predorsal; single large scale covers hind portion of cheek. Scales with 6 to 8 basal radiating striae, apical 21 to 29; circuli very fine.

D. IX, 9, 1 or 10, 1, eighth spine 2⅓ to 2½ in head, first ray 2½ to 3⅙; A. III, 8, 1, third spine 2⅙ to 2⅖, first ray 2⅖ to 2½; caudal 1⅗ to 1⅔, convex behind; least depth of caudal peduncle 2⅘ to 3; pectoral 1¾ to 2; ventral 2$\frac{1}{10}$ to 2⅛.

Brown generally. Pale band transversely across front of caudal peduncle. Pale vertical band close behind eye, extending above and below. Iris brown, with yellowish ring around pupil. Vertical fins all pale brownish, with black ocellus at last dorsal spines, on front of soft anal and at caudal subterminally and medianly. Sometimes caudal blotch broken or absent. Ventral largely black, basally broadly whitish and marginally narrowly whitish, within and depress against dusky or blackish brown blotch in abdomen size of their own extent.

Type.—Cat. No. 89968, U.S.N.M.

Known only from the Philippines and the 4 examples below.

[1678.] Atulayan Island. June 18, 1909. Length, 39 mm. No transverse white lines on body. Only rather obscure transverse broad pale band at front of caudal peduncle. No white line on side of snout.

1 example, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 56 mm. Type.

2 examples, Mabul Island. September 29, 1909. Length, 45 to 47 mm.

17609. Port Langcan, Palawan. April 8, 1919. Length, 40 mm.

1 example, Rapurapu Island. June 24, 1909. Length, 49 mm. Paratype. Pale band behind head extends across occiput and bounded by brown line in front and behind its entire extent.

13704. Cape Kait, Libani Bay. Celebes. December 29, 1909. Length, 48 mm. Paratype.

(Named for the Philippines.)

Genus EPIBULUS Cuvier

Epibulus Cuvier, Règne Animal, vol. 2, 1817, p. 264. Type *Sparus insidiator* Pallas, monotypic.

Body oblong, compressed. Mouth exceedingly protractile and lower jaw greatly produced backward; ascending branches of premaxillaries, mandibles and tympanic greatly prolonged. Teeth uniserial; front canines ½; no hind canines. Preopercle entire. Lateral line interrupted. Scales very large, but 2 rows cover cheek. Dorsal spines 9, pungent, rays 10 or 11. Anal spines 3, rays 8 or 9.

A single species in the Indo-Pacific, remarkable among all fishes for the exceptionally protractile mouth.

EPIBULUS INSIDIATOR (Pallas)

Sparus insidiator Pallas, Spicil. Zool., vol. 8, 1770, p. 41, pl. 5, fig. 1. Java.

Epibulus insidiator Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. (xiii) 110, pls. 398 and 399 (Java, Mauritius, Moluccas).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 135 (Amboina and China).—Bleeker, Atlas Ich. Ind. Néerl., vol. 1, 1862, p. 74, pl. 22, fig. 3 (Java, Duizend Islands, Cocos, Singapore, Sumatra, Nias, Celebes, Batjan).—Kner, Reise Novara, Fische., vol. 2, 1865, p. 252 (Singapore).—Günther, Fishes of Zanzibar, 1866, p. 91 (Zanzibar).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 250, pl. 137 (East Africa to South Sea).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Macassar).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 506 (Okinawa, Riu Kiu).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 366 (Saleyer).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 51 (Zamboanga).—McCulloch and Whitley, Mem. Queensland Mus., vol. 8, 1925, p. 168 (Port Denison).

Epibulus aureus (Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 75 (name in synonymy).

Epibulus aureus var. *flava* Bleeker, Atlas. Ichth. Ind. Néerl., vol. 1, 1862, p. 75 (name in synonymy).

Epibulus striatus Day, Proc. Zool. Soc. London, 1876, p. 697. Andaman Islands; Fishes of India, pt. 3, 1877, p. 395, pl. 87, fig. 2 (type); Fauna British India, vol. 2, 1889, p. 400, fig. 135 (type).

Depth 2 to 2¼; head 2½ to 2⅔, width 2⅕ to 3. Snout 3$\frac{1}{10}$ to 3⅔; eye 4 to 6, 1⅛ to 2 in snout, 1⅕ to 1½ in interorbital; maxillary reaches opposite middle of eye, 2 to 2⅓ in head; mandible 1$\frac{1}{10}$ to 1¼; interorbital 4⅓ to 5, convex. Gill rakers 6+11, lanceolate, moderate.

Scales in lateral line 13 to 15+6 to 8+2 or 3; 2 scales above lateral line, 6 below, 7 predorsal. Scales with 8 or 9 basal radiating striae, with many as 7 incomplete auxiliaries; apical 24 to 36; circuli very fine.

D. IX, 10, 1, ninth spine 3 to 3⅞ in total head length, seventh ray 1⅔ to 1¾; A. III, 8, 1, third spine 3 to 3¾, sixth ray 1⅖ to 1⅔; caudal 1 to 1¼, hind edge concave, truncate as expanded, upper and lower rays with exserted points; least depth of caudal peduncle 2¼ to 2⅖; pectoral 1½ to 1⅔; ventral 2½ to 2⅘ in combined head and body.

Dusky brown or chocolate generally. Pectorals brownish, other fins all dusky or blackish brown. Iris brown.

East Africa and Mauritius to the East Indies, Riu Kiu and Tahiti. We have no examples as small as *Epibulus striatus* which has been placed as the young by Günther. Our smallest examples show the several transverse whitish or pale narrow bands as in Day's figure.

10324. Balikias Bay, Lubang Island. July 17, 1908. Length, 178 mm.
23729. Biri Channel. June 1–2, 1909. Length, 103 mm.
15875. Bolalo Bay, Palawan. December 2, 1908. Length, 217 mm.

A. 682 and A. 683. Bum Bum Island. September 25, 1909. Length, 300 mm.
14541. Butauanan Island. June 3, 1909. Length, 128 mm.
7199. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 223 mm.
16415. Cagayan Island. March 31, 1909. Length, 163 mm.
6275 and 7860. Candaraman Island, Balabac. January 4, 1909. Length, 107 to 218 mm.
14839. Casogoran, Malhon Island. July 27, 1909. Length, 95 mm.
9790 and 12573. Caxisigan Island, off Balabac. January 2, 1909. Length, 118 to 147 mm.
12575. Caxisigan Island. June 2, 1909. Length, 150 mm.
6523. Cebu market. April 5, 1908. Length, 143 mm.
1 example, Danawan Island and Si Amil Island. September 29, 1909. Length, 85 mm.
17085. Dupon Port, Leyte Island. March 17, 1909. Length, 120 mm.
21528. Endeavor Strait, northwest coast of Palawan. December 22, 1908. Length, 97 mm.
7558, 12686, 15734, 16331. Endeavor Strait. December 23, 1908. Length, 132 to 260 mm.
8241. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 248 mm.
A. 1217. Gomomo Island. December 3, 1909. Length, 290 mm.
4601 (Dr. 5480). Grande Reef, Subig Bay. January 8, 1908. Length, 190 mm.
22838. Isabel, Basilan. September 11, 1909. Length, 68 mm.
18544. Little Santa Cruz Island. May 28, 1908. Length, 114 mm.
16154. Mahinog, Camiguin Island. August 3, 1909. Length, 112 mm.
22804. Opol, Mindanao Island. August 4, 1909. Length, 93 mm.
7952. Pagapas Bay, Luzon. February 20, 1909. Length, 240 mm.
11307. Palag Bay vicinity, Luzon. June 16, 1909. Length, 169 mm.
15. Pandanon Island. March 23, 1909. Length, 145 mm.
17655. Pandanon Island. March 23, 1909. Length, 122 mm.
14652 and 14653. Parang, Mindanao. May 23, 1908. Length, 198 to 203 mm.
13111. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 115 mm.
8068. Pitogo Anchorage, Luzon. March 3, 1909. Length, 230 mm.
17870. Polloc, Mindanao. May 22, 1908. Length, 178 mm.
8192. Port Busin, Burias Island. March 8, 1909. Length, 240 mm.
7416 to 7418. Port Galera, Mindoro. June 9, 1908. Length, 155 to 235 mm.
18898. Port Maricaban. July 12, 1908. Length, 210 mm.
10343, 10344, 10469, 10485. Port Maricaban. July 21, 1908. Length, 122 to 188 mm.
16952. Port Matalvi, Luzon. November 22, 1908. Length, 153 mm.
7412, 11578, 12112, 15150. Port Uson, west of Pinas Island. December 17, 1908. Length, 88 to 168 mm.
12595. Rapu Rapu Island. November 9, 1909. Length, 92 mm.
7390. Romblon Harbor. March 25, 1908. Length, 133 mm.
7325. Sablayan Bay, Mindoro. December 12, 1908. Length, 236 mm.
5722. Suragao, Mindanao. May 8, 1908. Length, 230 mm.
22845. Talisse Island. November 9, 1909. Length, 92 mm.
20717. Tambul Sigambul, Tonquil Island. September 14, 1909.
12699. Tara Island. December 14, 1908. Length, 120 mm.
8666. Tara Island. December 15, 1908. Length, 152 mm.
6840. Tataan, Simaluc Island. February 19, 1908. Length, 105 mm. [147.]
Yellowish: lower head dusky citron yellow, back and posterior portions brownish; in middle of upper region scales with vertical bars of seal brown. Dorsal dusky lemon yellow at base, orange centrally, more of body color

distally; black blotch in front of base in first and second membranes; soft portion with dark olive green shades. Caudal and anal clouded with olive green. Ventral dark olive green and citron yellow. Pectoral hyaline distally, citron yellow shades with dusky proximally. Rim of orbit bright blue; pupil emerald green; iris bronzy olive.

12372. Tataan. February 21, 1908. Length, 205 mm.

15436 and 15432. Ulugan Bay, near Rita Island. December 29, 1908. Length, 61 to 200 mm.

7130. West coast Palaui Island. November 10, 1908. Length, 238 mm.

6975. West coast of Sabtan Island. November 8, 1908. Length, 190 mm. Quite pale brown, especially head and caudal fin.

A1192. Doworra Island, Patiente Strait, Dutch East Indies. December 2, 1909. Length, 300 mm. From occiput to middle of back red-brown, dusky olive below. Short brown stripe in front of eye continued behind to upper angle of gill opening, preorbital yellowish under this. Dorsal olive, with two red brown bars. Anal similar.

[2099.] Gane Road, Gillolo Island, Dutch East Indies. December 1, 1909. Length, 62 mm. Distinct black blotch on first dorsal membrane and base of second, yellow behind on tip of second and base of third; black blotch along middle of first soft rays, beginning with second; similar blotch less distinct on anal.

[2099.] Gane Road, Gillolo Island. December 1, 1909. Length, 62 mm.

13856 to 13858. Apra Bay, Guam. November 19–21, 1907. Length, 101 to 160 mm.

52440 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 68 to 300 mm. 7 examples.

19974 U.S.N.M. Mauritius. Length, 230 mm. 1 example.

71790 U.S.N.M. Nafa, Okinawa. *Albatross* Collection. Length, 112 mm. 1 example.

84252 U.S.N.M. Phillipines. Dr. Fred Baker. Length, 222 mm. 1 example.

84263 U.S.N.M. Philippines. Dr. F. Baker. Length, 160 mm. 1 example.

32211 to 32215 A.N.S.P. Samoa. Bureau of Fisheries. Length, 75 to 270 mm.

Genus DUYMAERIA Bleeker

Duymaeria Bleeker, Act. Soc. Ind. Néerl. (Amboyna), vol. 1, 1856, p. 52. Type *Duymaeria amboinensis* Bleeker.[16]

Labrastrum Guichenot, Rev. Mag. Zool., ser. 2, vol. 12, 1860, p. 152. Type *Ctenolabrus flagellifer* Valenciennes, orthotypic.

Body rather deep, oblong, compressed. Canines $\frac{4}{4}$, strong; hind canine present each side; teeth in jaws uniserial. Preopercle denticulated. Scales very large, 20 or 25 in lateral line. Cheeks and opercles with large scales. Lateral line continuous. Dorsals with narrow scaly sheath. Dorsal spines 9, anterior elevated and sometimes filamentous; rays 11 or 12, soft fin rounded. Anal spines 3, rays 9. Caudal rounded.

Small fishes with bright colors, sexually dimorphic. East Indies, China, Japan.

[16] According to Jordan, Genera of Fishes, vol. 2, 1919, p. 267, as "logotype *Crenilabrus aurigaria* Rich.," but *Duymaeria amboinensis* Bleeker, the eighth species in Bleeker's list, is the only one described. We therefore consider it the type.

ANALYSIS OF THE SPECIES

a^1. Scales without median dark blotch ..... flagellifera.

a^2. Each scale with median dark blotch, producing variegated appearance. guttata.

DUYMAERIA FLAGELLIFERA (Valenciennes)

Ctenolabrus flagellifera VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 240. No locality.—SCHLEGEL, Faun. Jap., Poiss., pts. 7–10, 1845, p. 166, pl. 86, fig. 2 (Nagasaki).

Duymaeria flagellifera GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 121 (copied); Rep. Voy. Challenger, vol. 1, 1880, p. 53 (Zamboanga).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 623 (Tokyo, Misaki, Wakanoura, Kobe, Nagasaki, Formosa).—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, 1903, p. 354 (Keerun, Formosa).—SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, 1906, p. 480 (Kagoshima).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 420 (Tokyo and Nagasaki).—SEALE, Philip. Journ. Sci., vol. 9, 1914, p. 69 (Hongkong).

Dygmaeria flagellifera FRANZ, Abhandl. K. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, 1910, p. 52 (Yokohama).

Ctenolabrus aurigarius RICHARDSON, Voy. Sulphur, Fish., 1844, p. 90, pl. 45, figs. 1–2. Canton (male).

Duymaeria aurigaria GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 121 (China).—KNER, Reise Novara, Fische, vol. 2, 1865, p. 249 (Hongkong).—KÁROLI, Termesez. Füzetek, Budapest, vol. 5, 1881, p. 174 (Canton and Nagasaki).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 550 (Luzon, Cavite, Santa Cruz).

Ctenolabrus rubellio RICHARDSON, Voy. Sulphur, Fish., 1844, p. 93, pl. 45, fig. 3. Canton (young male).

Crenilabrus spilogaster BLEEKER, Nat. Tijds. Ned. Indie, vol. 6, 1854, p. 416. Nagasaki; Verh. Batav. Genootsch. (Nalez. Jap.), vol. 26, 1862, p. 113, pl. 8, fig. 2 (Nagasaki; female).

Duymaeria spilogaster GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 122 (copied).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Yokohama).—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Yokohama).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).

Duymaeria japonica BLEEKER, Act. Soc. Sci. Ind. Néerl. (Amboyna), vol. 1, 1856, p. 53. Nagasaki; (on SCHLEGEL; male).

Duymaeria amboinensis BLEEKER, Act. Soc. Sci. Ind. Néerl. (Amboyna), vol. 1, 1856, p. 54. Amboina; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 78, pl. 23, fig. 7 (Amboina).

Duymaeria caeruleomaculata GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 122. Aneiteum, New Hebrides.

Depth 2½ to 2⅗; head 2⅗ to 2¾, width 2⅛ to 2⅔. Snout 3 to 3⅛; eye 4 to 5⅓, 1$\frac{1}{10}$ to 1⅘ in snout, 1 to 1⅛ in interorbital; maxillary reaches pupil, length 2⅔ to 3⅗ in head; interorbital 4¼ to 5, level; hind preopercle edge finely denticulate, serrae about 20. Gill rakers 4+7, very short, lanceolate.

Scales in lateral line 17 or 18, 5 or 6+2 or 3; 2 scales above lateral line, 6 below, 4 predorsal. Scales with 16 to 27 basal radiating striae, apical 14 to 28. radiating from small median circle in male; circuli very fine.

D. IX or X, 10, 1 or 11, 1, ninth spine $2\frac{1}{10}$ to $2\frac{1}{2}$ in head, first ray $1\frac{3}{4}$ to 2; A. III, 9, 1, second spine 2 to $3\frac{1}{5}$, first ray 2 to $2\frac{1}{6}$; caudal $1\frac{1}{3}$ to $1\frac{1}{2}$, convex behind; least depth of caudal peduncle $2\frac{1}{2}$ to 3; pectoral $1\frac{1}{3}$ to $1\frac{2}{5}$; ventral, $1\frac{2}{3}$ to $1\frac{3}{4}$.

Male pale brownish generally. Body with 5 or 6 dark brown blotches along back, joined more or less along lateral line and with as many similar dark vertical blotches alternating along sides of body, these may be variably joined below. Iris pale straw color. In small and young examples all large dark blotches become more or less isolated. Three dusky brown spots along hind eye edge, upper two extending up toward spinous dorsal. Opercle and all fins, except pale gray pectoral with greenish gray tinge. Outer portions of dorsals, anals, caudal and ventral deep dusky grayish.

Female brown, each row of scales with longitudinal pale or grayish lines. Dusky or blackish blotch on hind part of opercle. Several vertical gray lines on cheek. Dark blotches on bases of dorsals dusky and fins all with whitish waved longitudinal lines. Caudal pale, with deep gray spots on each ray. Anal with 4 gray basal blotches and 4 or 5 whitish lines on front of spinous fins. Pectoral pale brown. Ventral grayish, with 4 or 5 obsolete pale spots.

East Indies, Philippines, Formosa, China, Japan. Though small in size it is frequently marketed. The sexes are quite different in color.

21836, 21837, 22534. Atulayan Bay, Lagonoy Gulf. June 17, 1909. Length, 64 to 70 mm. [1672.] Green and olive, mottled and clouded with darker and paler, becoming yellowish below. Dorsal hyaline, clouded with hyaline brownish, rather distinct spot on upper portion of first membrane; on posterior soft rays brownish in form of small spots on rays. Caudal rays olive, membranes similarly spotted with brown, also outer rudimentary rays more distinctly. Anal similar to soft dorsal. Ventrals pale bluish green, membranes alternately red, brown and pale or whitish spotted; tips of three posterior rays whitish. Pectorals hyaline pink. Oblique bar from eye backward across subopercle, brassy on cheek and pink immediately behind preopercular limb.

20484. Batan, Rapurapu Strait. June 5, 1909. Length, 77 mm. [1588.] Dull rosy slate, edges of scales more or less olive; on top of head olive predominates; from eye across front of cheek and behind chin rather broad dusky rose stripe with narrow blue borders. Tips of first three dorsal spines prolonged in orange filaments; incised portion of membranes rather dark, becoming vermilion on last three spinous membranes; dark shade continued across first four or five soft membranes; spinous portion of fin and anterior soft portion with oblique pale streaks; spines and rays with smaller white specks; posterior portion of soft fin hyaline with orange bars, which become scarlet on last rays. Caudal hyaline, tip dusky, fin crossed by five or six irregular bars formed by orange spots on membranes. Anal body color, with oblique pale streaks and small mottlings on rays; first two spines with short dusky rose filaments. Ventrals rosy, inner tip orange, fin crossed by paler bars. Pectoral hyaline pink, white spot in upper axil. Opercle with solid centered very narrow rimmed ocellus nearly size of eye; this readily separated from membrane bone and probably lost in many specimens.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 58 mm.
21894. Dalaganem Island. April 8, 1909. Length, 63 mm.
20516. Guijulugan Shore. April 2, 1908. Length, 90 mm.
5 examples, Mansalay, Mindoro. June 4, 1908. Length, 52 to 83 mm.
22599. Observatory Island. December 19, 1908. Length, 70 mm.
21020. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 60 mm.
1 example, Port Caltom. December 15, 1908. Length, 74 mm.
22660. Port Cataingan, Masbate, anchorage. April 18, 1908. Length, 97 mm.
22221. Rapu Rapu Island. June 22, 1909. Length, 105 mm. [1758.]
[1990.] Sitanki reef. September 24, 1909. Length, 100 mm.
[2037.] Talisse Island. November 9, 1909. Length, 65 mm. General color reddish, fading to olive and pale; lower head red; undulating slaty lines from eye forward to throat; brown opercular blotch with reddish border. Dorsal mottled red and paler, similar to body; black blotch on first membranes. Caudal and anal similar, caudal spots rather orange, forming almost bars. Paired fins reddish, pectoral hyaline.
11661 Kowloon market, China. October 5, 1908. Length, 167 mm.
1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 68 mm.
2 examples, Tidore Island. November 26, 1909. Length, 58 to 66 mm. (D.).
50246 U.S.N.M. Wakanoura, Japan. Jordan and Snyder. Length, 105 to 153 mm. 6 examples.
51808 U.S.N.M. Mogi, Japan. Dr. E. A. Mearns. Length, 109 mm. 1 example.
57674 U.S.N.M. Japan. P. L. Jouy. Length, 155 to 177 mm. 2 examples
59689 U.S.N.M. Kagoshima. Dr. H. M. Smith. Length, 171 mm. 1 example.
71254 U.S.N.M. Tokyo market. *Albatross* collection. Length, 130 to 164 mm. 2 examples.
71566 U.S.N.M. Nagasaki. *Albatross* collection. Length, 178 mm. 1 example.
76262 U.S.N.M. Japan. E. S. Morse. 1878. Length, 140 mm. 1 example.
57677 U.S.N.M. Japan. P. L. Jouy. Length, 124 to 153 mm. 4 examples.
2226, 57554, 57676 U.S.N.M. Japan. P. L. Jouy. Length, 110 to 125 mm. 4 examples.
26201 and 26202 A.N.S.P. Tokyo, Japan. Jordan and Snyder. Length, 168 to 190 mm.

DUYMAERIA GUTTATA, new species

Depth 2½ to 2⅗; head 2⅖ to 2⅗, width 2⅛ to 2½. Snout 3 to 3⅕; eye 3⅔ to 4⅛, 1⅕ to 1½ in snout, equal or little greater than interorbital; maxillary reaches eye, 2⅘ to 3⅙ in head; interorbital 3¾ to 4¼, broadly convex; hind preopercle edge with 6 denticles. Gill rakers 4+8, short, lanceolate.

Scales in lateral line 18+6+2; 2 scales above lateral line, 6 below, 4 predorsal; 2 rows of cheek scales. Scales with 11 to 16 basal radiating striae; apical 20 to 22, all radiating from median circle; circuli fine.

D. X, 10, 1, tenth spine $1\frac{9}{10}$ to 2⅛ in head, first ray $2\frac{1}{10}$ to 2⅛; A. III, 9, 1, second spine $2\frac{1}{10}$ to 2⅛, first ray $1\frac{9}{10}$ to $2\frac{1}{10}$; caudal 1⅔ to 1½, hind edge concave; least depth of caudal peduncle 2⅗ to 2⅔; pectoral 1⅔ to 1¾; ventral 1¾ to 2.

Brown generally, scarcely paler below, with 5 transverse narrow pale or whitish vertical lines, more or less irregular and broken or becoming indistinct with age. Each scale with slightly darker vertical central blotch, more or less darker and pronounced on breast and belly or about edges of body. Along median axis of body row of small round black spots, one at middle of each dark broad vertical band, latter reflected upon bases of dorsals and anals, also pale dividing lines. Three small black spots behind eye, also 1 or more followed by 1 or 2 more. Head otherwise pale below, with vertical deep brown variable streaks, formed as 4 pairs across mandible. All markings on lower surface of head strongly contrasted. Iris brownish yellow. In darker areas noted above on vertical fins, fine waved, vertical, dark lines and formed as 6 faint cross-bands on caudal. Pectoral uniformly pale brownish. Ventral pale, finely ribbed, with deep brown to blackish, with tinge of dusky medially to fin.

Easily distinguished from *Duymaeria flagellifera* by its variegated or finely blotched appearance.

Type.—Cat. No. 89969, U.S.N.M.

20473. Catbalogan, Samar. April 16, 1908. Length, 72 mm. Type.
18382. Cebu market. April 4, 1908. Length, 69 mm. Paratype.
18343. Port Usin, west of Pinas Island. December 17, 1908. Length, 56 mm. Paratype.

Genus LABRICHTHYS Bleeker

Labrichthys Bleeker, Nat. Tijds. Ned. Indie, vol. 6, 1854, p. 331. Type *Labrichthys cyanotaenia* Bleeker, monotypic.

Thysanocheilus (not *Thysanochilus* Philippi 1857) Kner, Anz. Akad. Wiss. Wien, 1865, p. 185. Type *Thysanocheilus ornatus* Kner, monotypic.

Thysanochilus Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 242. Type *Thysanocheilus ornatus* Kner.

Body oblong, compressed. Head pointed. Lips fleshy. Canines anteriorly 4 above, 2 below; hind canine present each side. Head covered with small scales, much smaller than on body. Scales in lateral line large, 25 to 27. Body scales pass out well over bases of all vertical fins. Lateral line complete. Dorsal fin with 9 spines and 11 rays. Anal with 3 spines and 10 rays.

One species in the Indo-Pacific.

Labrichthys caudovittatus Steindachner [17] can not be admitted to the present genus as the dorsals and anals are scaleless.

Elera has reported *Labrichthys rubiginosa*,[18] which is a species of *Pseudolabrus*, from Luzon, Santa Cruz, and Cavite. As no species of *Pseudolabrus* has been found in our collections we prefer to consider Elera's record as doubtful.

[17] Sitz. Akad. Wiss. Wien, vol. 107 (1), 1898, p. 783, pl. 1, fig. 3. Suez.
[18] Cat. Fauna Filip., vol. 1, 1895, p. 550.

LABRICHTHYS CYANOTAENIA Bleeker

Labrichthys cyanotaenia Bleeker, Nat. Tijds. Ned. Indie, vol. 6, 1854, p. 331. Larantuka, Flores; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 154, pl. 22, fig. 1 (Flores).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 116 (copied).

Labrichthys cyanotaenius Günther, Ann. Mag. Nat. Hist., London, ser. 3, vol. 8, 1861, p. 385 (name only).

Thysanochilus cyanotaenia Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 242 (Zanzibar, Flores, Samoa).

Thysanocheilus ornatus Kner, Anz. Akad. Wiss. Wien, 1865, p. 185. Upolu, Samoa.—Kner, Denks. Akad. Wiss. Wien, vol. 24 (1), 1865, p. 5, pl. 3, figs. 1, 1*a* and 1*b*. (Upolu).

Labrichthys australis Steindachner, Verh. zool. bot. Ges. Wien, vol. 16, 1866, p. 476. South Seas.

Platyglossus ocellatus Kner and Steindachner, Sitz. Akad. Wiss. Wien, vol. 54 (1), 1866 (1867), p. 377, fig. 8. Upolu, Samoa.

Chaerojulis castaneus Kner and Steindachner, Sitz. Akad. Wiss. Wien, vol. 54 (1), 1866 (1867), p. 394, text figs. *a*. *b*. Upolu (same types as *Platyglossus ocellatus*).

Depth 2⅘ to 2⅞; head 2⅘ to 2⅞, width 2½ to 2¾. Snout 3 to 3⅛; eye 4⅘ to 6, 1⅔ to 2 in snout, 1⅛ to 1⅞ in interorbital; maxillary reaches ½ to ⅗ in snout, 4½ to 5 in head; interorbital 3¼ to 4⅔, convex. Gill rakers 10, short, weak points on lower branch of first arch.

Scales in lateral line 20, 5+0 or 1; 5 scales above lateral line, 11 below, 28 to 35 predorsal, forward midway on snout. Scales with 33 to 43 basal radiating striae; apical radiating striae 13 to 19; circuli fine.

D. IX, 11, 1, ninth spine 3 to 3¼ in head, first ray 2¾ to 3; A. III, 10, 1, third spine 5¼ to 5½, first ray 3 to $3\frac{1}{10}$; caudal 1½, convex; least depth of caudal peduncle $1\frac{9}{10}$ to 2; pectoral 1⅞ to $1\frac{9}{10}$; ventral 2¼ to 2⅖ in combined head and body.

Vandyke brown generally, with line of blue spots, 1 to each scale, longitudinally. Some examples with gray white area behind gill-opening, variably of 6 to 8 scales wide. Blue lines from scales all crowd variably on head forward. Vertical fins largely blackish, with whitish or buff edges and dorsals and anals with several longitudinal bluish lines within dark area. On caudal several vertically directed bluish lines, variably reticulate. Pectoral base blackish, rest of fin pale brown, often more grayish terminally. Ventral dusky to blackish, with anterior marginal, median and posterior longitudinal blue line. Iris deep olive brown.

Zanzibar, East Indies, Samoa. Not previously reported from the Philippines.

20486. Batan, Rapurapu Strait. June 5, 1909. Length, 96 mm. [1587.] General color brownish black; from level of upper pectoral base anterior side to above front of anal crossed by narrow bluish stripe through center of each row of scales, margins being dark, almost color of darkest portion of body;

central portion of scales, dark portion of body shows still darker stripe through center of each scale row. Head similar to body, but with somewhat purplish overshade; lips and top of chin yellow; purple stripe across snout and chin joining at corner of mouth, fork again, front stripe passing across upper preorbital and through nostril; lower base to lower edge of eye, thence branching downward across cheek and giving off another branch even with front of eye, which passes downward in front of cheek to lower edge of subopercle. Tips of dorsal spines and rays hyaline; very obscure slaty stripe through outer half of fin, apparent only on soft portion. Caudal white tipped, an obscure slaty purple band through outer half and irregularly second nearer base. Anal white at margin, most prominent in front, with about three blue bars. Ventrals black, with dashes of purple. Pectorals dusky hyaline yellowish at bases of rays, purple black on fleshy base.

17057. Bisucay Island, near Cuyo. April 9, 1909. Length, 139 mm. [1514.]

1 example, Danawan and Si Amil Islands. September 27, 1909. Length, 97 mm.

16642. Galera Bay, Mindoro. June 9, 1908. Length, 123 mm.

10909. Isabel, Basilan. April 11, 1909. Length, 144 mm.

21298 and 21300. Tidore Island, south of Ternate. November 24, 1909. Length, 105 to 111 mm.

52459 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 60 to 82 mm. 3 examples.

Genus LABROIDES Bleeker

Labroides Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 249. Type *Labroides paradiseus* Bleeker, monotypic.

Fissilabrus Kner, Sitz. Akad. Wiss. Wien, vol. 40, 1860, p. 14. Type *Cossyphus dimidiatus* Valenciennes, monotypic.

Diproctacanthus Bleeker, Proc. Zool. Soc. London [December 10], 1861, p. 415. Type *Labroides xanthurus* Bleeker, orthotypic.

Body oblong, compressed. Snout pointed. Lips prominent, lower divided into 2 lobes (Labroides) or without produced lobes (Diproctacanthus). Teeth in jaw minute, in bands. Pair of curved erect canines in front of each jaw, upper pair recurved in lower; posterior canine each side. Gill membrane joined to isthmus. Opercles, cheeks and bases of vertical fins scaly. Scales rather small, 35 to 50 in lateral line. Lateral line complete. Dorsal spines 9, rays 9 to 11. Anal spines 2 or 3, rays 9 or 10.

Small fishes of the Indo-Pacific.

ANALYSIS OF THE SPECIES

a^1. Scales small, 48 to 51; median black lateral band, expanding out over caudal fin ..... dimidiatus.

a^2. Scales large, 27 to 36.

b^1. Median black lateral band, but not expanding behind or extending on caudal ..... xanthurus.

b^2. No black lateral band; front half of body abruptly blackish, posterior whitish and in strong contrast ..... bicolor.

LABROIDES DIMIDIATUS (Valenciennes)

Cossyphus dimidiatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 136. Mauritius.

Labroides dimidiatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 119 (East Indies); Fishes of Zanzibar, 1866, p. 87 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol 21, 1871, p. 548 (Koseir, Red Sea).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Day, Fishes of India, pt. 3, 1877, p. 393, pl. 87, fig. 1.—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 243 (East Africa, Pelew Islands, Yap, New Hebrides, Samoa, Hawaii).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Manado).—Day, Fauna British India, vol. 2, 1889, p. 397, fig. 133.—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Maldives, Felidu).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 363 (Savu Island).

Labrus latovittatus (not Lacépède) Rüppell, Neue Wirbelth., Fische, 1835, p. 7, pl. 2, fig. 2. Tor, Red Sea.

Labroides latovittatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1865, p. 155, pl. 44, fig. 1 (Amboina, Goram, Letti. Timor).

Labroides paradiseus Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 249. Neira, Banda.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 119 (East Indies).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 155, pl. 44, fig. 2 (Java, Cocos, Sumatra, Celebes, Sangi, Ternate, Batjan, Buru, Amboina, Haruko, Banda, Goram, Letti).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina River).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Sangi).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 55 (Coast of Cebu).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).

Depth 4¼ to 5; head 3⅕ to 3¼, width 2⅘ to 3. Snout 3¾ to 3⅘; eye 4½ to 5, 1¼ to 1⅓ in snout, 1¼ in interorbital; maxillary reaches ½ to ⅔ to eye, 5 to 6 in head; lips thick, fleshy, both with median division; interorbital 3¾ to 3⅘, broadly convex. Gill rakers 3+6, short rudiments.

Scales in lateral line 36 to 40, 11+1; 5 scales above lateral line, 10 below, 9 or 10 predorsal. Scales with 16 to 22 basal radiating striae, apical 11 to 16; circuli fine.

D. IX, 11, 1, ninth spine 4 to 5 in head, first ray 2¾ to 3; A. III, 10, 1, third spine 3½ to 4, first ray 2½ to 2⅗; caudal 1⅕ to 1⅖, truncate; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅗ to 1⅘; ventral 2⅛ to 2⅕.

Back gray. Dusky ill-defined band from snout tip to spinous dorsal and along its base. Black band from side of snout to pupil, width greater than pupil and not quite equal to eye; continues behind, expanding on caudal peduncle above to bases of upper median caudal rays and then out over caudal fin to hind edge, where also further expanded. Entire under surface of body white. Iris gray white. Dorsal gray, with broad median dark gray longitudinal band, black on first two membranes and extending back at median paler longitudinal band length of whitish soft dorsal. Anal whitish, with blackish basal longitudinal band. Along lower caudal lobe

black line given off at hind edge from upper broad black band and extends forward along whole lower edge of caudal and caudal peduncle. This band broken or absent from caudal in small examples. Paired fins white, with brown or black spot below bases of lower pectoral rays. Most examples have lower part of head anteriorly and muzzle soiled brown or dusky.

Red Sea, Zanzibar, Mauritius to the East Indies, Philippines, Samoa, Hawaii.

5094. Cebu market. April 5, 1908. Length, 93 mm.
1 example, Simaluc Island. September 22, 1909. Length, 78 mm.
5013. Surigao, Mindanao. May 8, 1908. Length, 54 mm.
56230 U.S.N.M. Bacon. Philippine Commission. Length, 70 mm.

The following is referred to this species:

No. 1289, Ragay Bay, Ragay Gulf, Luzon. March 10, 1909. We have not found the specimen. Top of head and anterior back drab; lower head dusky silvery, merging into bright blue on side through breast and pectoral region; bright black stripe beginning at corner of mouth, passes through eye and broadens posteriorly to include most of peduncle above lateral line, continued to tip of dorsal somewhat obliquely downward; shorter black stripe begins behind anal, runs obliquely across caudal to join upper stripe at tip. Dorsal bluish, black stripe at base covering most of spinous portion. Anal bright blue, with black stripe near base beginning about second spine, broadening to include all of last ray. Paired fins dusky, small black spot below pectoral base.

LABROIDES XANTHURUS Bleeker

Labroides xanthurus Bleeker, Act. Soc. Sci. Ind. Néerl. (Manado), vol. 1, 1856, p. 52. Manado, Celebes.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 120 (copied).

Diproctacanthus xanthurus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 156, pl. 21, fig. 2 (Manado).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 131 (Ambon).

Depth 3⅘; head 2⅞, width 2¾. Snout 3⅙; eye 5½, 1⅔ in snout, 1⅗ in interorbital; maxillary reaches ½ to eye, 4⅗ in head; lips thick, fleshy, finely papillose; interorbital 3⅔, broadly convex; preopercle edge entire. Gill rakers 3+6, short, weak points.

Scales in lateral line 29, 6+1; 8 scales above lateral line, 14 below, 16 predorsal; 4 rows across upper posterior part of cheek. Scales with 14 to 16 basal radiating striae, 9 or 10 apical; circuli very fine. D. IX, 10, 1, ninth spine 3⅘ in head, first ray 3⅔; A. III, 9, 1, second spine 5½, first ray 2⅔; caudal 1⅔, truncate, little convex as expanded; pectoral 2; ventral 2⅛.

Back dull chocolate brown. Lips in front seal brown. From end of snout each side to eye and then back along median axis of body broad bistre band to bases of supero-median caudal rays. Under surface of head and body white. Iris pale pea green. Dorsals pale brown, other fins whitish.

East Indian region. Bleeker had but 2 examples, 39 and 69 mm. long and Beaufort an example 36 mm. long. The only other example known is listed below.

16258. Teomabal Island. September 18, 1909. Length, 97 mm. [1955]. Back slaty or olive; pale whitish olive stripe begins behind premaxillary on snout, passes over eye and backward to root of caudal; under this a broad band passing through eye to base of caudal, similar in color to back, probably blackish at some stages; tip of opercle very narrowly yellow; lips black at point of head; silvery stripe from corner of mouth broadening backward obliquely downward across cheek and opercle; pink shade under this; lower side of body silvery with slight yellowish wash. Base of dorsal body color; above this bar of same color as first body stripe; this central on soft portion, distal part of fin hyaline. Caudal cadmium yellow, black and whitish bars extending on to its base. Anal hyaline. Paired fins slightly dusky.

LABROIDES BICOLOR, new species

Depth 3⅖; head 2⅔, width 2⅖. Snout 3⅕; eye 6½, 2 in snout, 1⅘ in interorbital; maxillary reaches ⅗ to eye, 5¼ in head; lips both divided, broad and fleshy; canines anteriorly ⅔, strong; strong posterior canine each side; interorbital 3⅖ in head, broadly convex. Gill rakers 3+7, short, weak points.

Scales in lateral line 20, 6+1; 4 scales above lateral line, 10 below, 9 predorsal to occiput. Scales with 33 to 38 basal radiating striae, apical 36 to 38; circuli very fine.

D. IX, 11, 1, ninth spine 5⅔ in head, first ray 3⅖; A. III, 10, 1, third spine 4⅓, first ray 3; caudal 1½, convex behind; least depth of caudal peduncle 2⅛; pectoral 1⅔; ventral 2¼.

Anterior half of body vandyke-brown and posterior half rather abruptly white, including caudal except a black submarginal crescent on latter. Dorsals and anals blackish brown basally, abruptly and broadly white edged. Paired fins dark. Pectoral grayish and without dark base. Ventral more brown, front edge slightly gray.

Known only from a single example. Apparently a very distinct species and readily distinguished by its greatly contrasted color pattern.

Type.—Cat. No. 89970, U.S.N.M.

10472. Port Maricaban. July 21, 1908. Length, 110 mm. Type.

(*Bicolor*, two colors.)

Genus ANAMPSES Quoy and Gaimard

Anampses (Cuvier) Quoy and Gaimard, Voy. Uranie, Zool., November 20, 1824, p. 276. Type *Anampses cuvier* Quoy and Gaimard, monotypic.

Anampsis Swainson, Nat. Hist. An., vol. 2, 1839, p. (173) 233 (error).

Ampheces Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 628. Type *Anampses geographicus* Valenciennes, monotypic.

Body oblong, compressed. Caudal peduncle compressed. Head moderate, compressed, pointed. Teeth uniserial. Canines ⅔, promi-

nent, extend forward, compressed, with cutting edges. No hind canines. Preopercle entire. Scales moderate or large. Head scaleless. Lateral line continuous. Dorsal spines 9, rays 12. Anal spines 3, rays 12.

Rather large, dark colored fishes, of the Indo-Pacific.

ANALYSIS OF THE SPECIES

a^1. AMPHECES. About 50 scales in lateral line.

b^1. Head without bands; dorsal and anal with large black blotch on hind rays ..... **pterophthalmus.**

b^2. Head with blue bands and vermiculations; dorsal and anal without black blotch ..... **geographicus.**

a^2. ANAMPSES. Scales 27 to 30 in lateral line.

c^1. Head without round spots; caudal uniform yellow; pectoral base pale like rest of fin ..... **meleagrides.**

c^2. Head with blue bands or lines; pectoral base dark.

d^1. Each scale with round blue spot; caudal with small blue spots **coeruleo-punctatus.**

d^2. Each scale with blue vertical line or bar; caudal without spots; young with transverse pale band from middle of spinous dorsal down to side of abdomen ..... **dimidiatus.**

ANAMPSES PTEROPHTHALMUS Bleeker

Anampses pterophthalmus BLEEKER, Act. Soc. Ind. Néerl. (Amboina 8), vol. 2, 1857, p. 81. Amboina; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 102, pl. 24, fig. 3 (Amboina and Celebes).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 138 (Amboina); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 253 (Amboina, Celebes, Oualan).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 367 (Karkaralong Island).

Ampheces pterophthalmus JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 265 (Cuyo).

Depth 3 to 3⅛; head 2¾ to 2⅞, width 2⅕ to 2½. Snout 2¾ to 3; eye 6 to 8, 2¼ to 3 in snout, 1½ to 2 in interorbital; maxillary reaches ⅖ to ⅗ to eye, 3¾ to 5 in head; interorbital 3⅘ to 4, convex. Gill rakers 7+10, lanceolate, short, rather slender.

Scales in lateral line 39 or 40, 9 or 10+2; 9 or 10 scales above lateral line, 20 to 22 below, 15 to 17 predorsal. Scales with 14 to 19 basal radiating striae; 42 to 47 feeble or imperfect radiating apical striae; circuli very fine.

D. IX, 12, 1, ninth spine 3⅖ to 4¾ in head, third ray 2⅛ to 2⅘; A. III, 12, 1, third spine 4 to 5⅖, third ray 2⅔ to 2⅘; caudal 1⅔ to 1¾, slightly emarginate or truncate, slightly convex behind when expanded; least depth of caudal peduncle 2¼ to 2⅖; pectoral 1⅗ to 1⅞; ventral 2⅕ to 2⅓.

Largely dark uniform brown, varying from walnut brown to seal brown. Vertical fins all dark brown like body, only caudal with narrow whitish hind margin. On last 3 or 4 membranes of soft dorsal and anal a variable neutral black ocellus, its edge pale or whitish and size usually greater than eye, never absent and only anal ocellus

may be smaller than dorsal. Pectoral pale yellowish brown, its base dark like body. Ventral blackish brown or dark like trunk.

East Indies, Micronesia.

12666. Cebu market. April 4, 1908. Length, 182 mm.
7838. Cebu market. April 9, 1908. Length, 184 mm.
18802. Cebu market. April 21, 1909. Length, 177 mm.
6254 and 6255. Cebu market. August 29, 1909. Length, 141 to 153 mm.
19054. Cebu market. Length, 163 mm.
7191. Gondra Island. September 20, 1909. Length, 155 mm.
1 example, Jolo. March 6–7, 1908. Length, 153 mm.
9163. Little Santa Cruz, Zamboanga. May 26, 1908. Length, 174 mm.
17138. Murcielagos Bay, Mindanao. August 20, 1909. Length, 168 mm.
1 example, Philippines. Length, 178 mm. [1840.]
4803. Powati Harbor, Makyan Island. November 20, 1909. Length, 210 mm. Black on top of head; body above line of pectoral shading into tawny on hind third. Breast region and lower head brick red shades. Dorsal black, with brick-red shades in front and tawny behind; jet black ocellus on last three rays and membranes with narrow yellow rim. Lips whitish. Caudal sooty black, with narrow hyaline tip. Anal similar to dorsal but with more tawny shades; ocellus same, not quite so close to posterior edge. Anal black, with brick red membranes. Pectoral hyaline yellow, upper edge blackish, base black. Iris dark, with narrow crimson inner edge.
7650. San Roque, Leyte. July 29, 1909. Length, 159 mm. [1753.] Very dark olive-brown; scales show somewhat reddish margins on fading but no spots or bars; head similar but of more purplish shade. Dorsal and anal similar to body, without markings except large black centered tawny rimmed ocellus on last three or four rays; caudal plain except hyaline pinkish tips; ventrals colored as body; pectorals olive yellow; membranes more or less hyaline.
14298 and 14299. Teomabal Island. September 18, 1909. Length, 134 to 150 mm.

ANAMPSES GEOGRAPHICUS Valenciennes

Anampses geographicus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 10, pl. 389. No locality.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 102, pl. 25, fig. 3 (Amboina and Ceram).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 137 (Amboina); Cruise of Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Peters, Monats. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 628 (copied).

Anampses lineolatus Bennett, Proc. Zool. Soc. London, vol. 3, 1835, p. 208. Mauritius.

Depth 2⅔ to 3; head 2¾ to 3⅕, width 2⅓ to 2⅖. Snout 2¾ to 3⅛; eye 6 to 7½, 2⅕ to 2¾ in snout, 1½ to 2 in interorbital; maxillary reaches half way to eye, 4⅛ to 5 in head; interorbital $3^{5}/_{6}$ to 4, convex. Gill rakers 9+10, lanceolate, short, slender.

Scales in lateral line 38 to 39, 8 or 9+2; 10 or 11 scales above lateral line, 20 or 21 below, 16 to 20 predorsal. Basal radiating and marginal striae 15, apical 24 to 36, feeble or indistinct; circuli very fine.

D. IX, 12, I, ninth spine 3⅞ to 4⅛ in head, third ray 2⅔ to 3; A. III, 12, I, third spine 4⅙ to 4⅘, first ray 3 to 3⅙; caudal 1⅓ to 1⅗,

little concave behind, double concave when expanded; least depth of caudal peduncle 2⅓ to 2¾; pectoral 1⅘ to 2; ventral 2⅛ to 2⅓.

Dark brown, generally with plumbeous shades over head along vertical fins and body edges. Head with many rather fine vermiculating lines, of which 2 or 3 sometimes continuous across snout; several also extend down across lower side of head, chest, and breast. Scales on body each with small vertical pale or grayish line, becoming very fine dot on scales about body edges and on caudal base. Vertical fins all slaty plumbeous, finely dotted with whitish and edges broadly creamy white; on median portion of tail white lines mostly replace dots. Pectoral pale olive, with some pale whitish basal spots and lines. Ventral plumbeous, outer edge whitish, inner rays paler, also 2 or 3 whitish lines. Iris pale yellowish.

Mauritius to the East Indies and Japan. Our Cebu example shows rather obscure large dark ocellus on last dorsal and anal rays as in *Anampses pterophthalmus*. Most of the examples differ from Bleeker's figure in that both soft dorsal and anal have variably broken or short pale lines as well as spots.

5673. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 220 mm. [1778.] General shade olive with purplish tone anteriorly and blue posteriorly; vertical bar of scales bright blue with darker edges; dash of green above pectoral; on abdominal region vertical bars of scales changing to horizontal stripes, becoming dots along base of anal. Dorsal and anal with blue fronts and margins; body of dorsal olive below with reddish shade under marginal band, bright blue line at its base throughout and two rows of small dots above, outer one fusing into an almost solid line. Anal body purplish, central band of blue breadth of pupil; basal line similar to that on dorsal but broader and a single row of more or less fusing dots between and central band. Caudal rays blue, membranes reddish becoming permanent color to form two stripes to middle of lobes. Ventrals with blue fronts, line through rays more or less blue. Pectorals olive gray, rays more or less dusky, upper ray bright blue; blue bar across base, fleshy part below brownish; a second bar at base of fleshy part.

9116. Catbalogan, Samar. April 15, 1908. Length, 230 mm.

5954. Cavite market. December 1, 1908. Length, 237 mm.

5396 and 7839. Cebu market. April 7, 1908. Length, 183 to 214 mm.

11747. Port Banalacan, Marinduque Island. February 23, 1909. Length, 212 mm.

2 examples, Sitanki Reef. September 24, 1909. Length, 127 to 185 mm. [2149.]

1860. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 226 mm.

7184. Tara Island. September 20, 1909. Length, 174 mm.

ANAMPSES MELEAGRIDES Valenciennes

Anampses meleagrides Valenciennes, Hist. Nat. Poiss., vol. 14, 1840, p. 12. Mauritius.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 102, pl. 24, fig. 1 (Amboina).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 367 (Banda).

Anampses meleagris Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 135 (Mauritius and Amboina); Fishes of Zanzibar, 1866, p. 91 (Zanzibar).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 551 (C. de Cebu).

Depth 3 to 3⅖; head 3 to 3⅛, width 2⅖ to 2½. Snout 3⅛ to 3⅖; eye 5½ to 6, 1¾ to 2⅛ in snout, 1½ to 1⅘ in interorbital; maxillary half way to eye, 5⅙ in head; interorbital 3¾ to 3⅘, convex. Gill rakers 7 + 12, lanceolate, short.

Scales 21 or 22, 4 or 5 + 2 or 3 in lateral line; 4 scales above lateral line, 9 below, 10 predorsal. Scales with 15 to 18 basal radiating striae and 2 to 4 marginals each side; 40 to 56 imperfect radiating apical striae; circuli very fine.

D. IX, 12, 1, ninth spine 2⅖ to 2⅞ in head, third ray 2¼ to 2⅖; A. III, 12, 1, third spine 3 to 4, first ray 2⅖ to 2⅔; caudal 1¼ to 1⅓, little emarginate, slightly double concave when expanded; least depth of caudal peduncle 2⅕ to 2¼; pectoral 1½ to 1⅘; ventral 1⅚ to 2.

Deep brown to slate black generally. Each scale with strongly contrasted round white spot, small on smaller scales, especially along edge of back and tail. Head thickly and closely spotted with white, spots largest and some as short white blotches on cheeks, opercles and breast of some examples. Dorsals and anals with pale or white edges and finely spotted with whitish, largest spots all basal. Caudal yellowish white. Pectoral pale or dilute yellowish. Ventral with front edge narrowly whitish and several white blotches basally. Some examples variable with distinct black ocellus, or larger dark spot than any of pale spots, on last dorsal rays. Sometimes one may also be present on last anal rays.

Zanzibar and Mauritius to the East Indies.

17425. Bulan Island, Samales Group. September 13, 1909. Length, 160 mm.

15318. Cebu market. March 19, 1909. Length, 157 mm. [1399.] Ground color very dark brown, becoming orange on front of head, including lower parts; body of fins everywhere spotted with white or very pale yellow; spots of fins slightly smaller than those on body. Soft dorsal and anal with a narrow white margin. Caudal bright cadmium. Ventrals spotted, except terminal portion of last three rays. Pectorals hyaline, white bar along bases of rays.

15319. Cebu market. March 19, 1909. Length, 115 mm.

8835. Mahinog, Camiguin Island. August 3, 1909. Length, 130 mm.

8836. Mahinog. August 3, 1909. Length, 166 mm.

1 example, Pilas Island. September 12, 1909. Length, 170 mm.

19955 U.S.N.M. Mauritius. Col. N. Pike. Length, 160 mm. 1 example.

ANAMPSES CAERULEO-PUNCTATUS Rüppell

Anampses caeruleo-punctatus Rüppell, Atlas Reise Nördl. Afr., Fische, 1828, p. 42, pl. 10, fig. 1. Tor, Red Sea.—Günther, Fishes of Zanzibar, 1866, p. 91 (Zanzibar).

Anampses caeruleopunctatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 5 (Mauritius, Red Sea, Tor); Règne Animal Cuv. Ill., 1839, pl. 87, fig. 2.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 104, pl. 24, fig. 2 (Java and Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 135 (Mauritius).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 534 (copied).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauri-

tius).—Day, Fishes of India, pt. 2, 1877, p. 395 (Marquesas Islands); Fauna British India, vol. 2, 1889, p. 400, fig. 136.

Anampses coeruleopunctatus Bleeker, Verh. Akad. Wet. Amsterdam, vol. 18, No. 3, 1879, p. 1 (Mauritius).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 251 (Tahiti).

Anampses chlorostigma (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 7 (name in text).

Anampses coeruleomaculatus Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, pl. 138.

Anampses pulcher Regan, Proc. Zool. Soc. London, 1913, p. 371, pl. 58, fig. 3, pl. 59. Easter Island and Tahiti.

Depth 2⅔ to 2⅘; head 2¾ to 2⅘, width 2½ to 2⅔. Snout 2½ to 2⅗; eye 6⅓ to 6⅘, 2½ to 2⅔ in snout, 1⅗ to 1¾ in interorbital; maxillary reaches half way to eye, 3⅞ to 4⅕ in head; interorbital convex, 3⅞ to 4. Gill rakers 8+12, lanceolate, short.

Scales in lateral line 21, 5 or 6+1; 5 or 6 scales above lateral line, 10 or 11 below, 11 predorsal. Scales with 17 to 19 basal radiating striae with 3 or 4 marginals; 24 to 28 obsolete radiating apical striae; circuli very fine.

D. IX, 12, 1, ninth spine 3⅕ to 3⅖ in head, third branched ray 2⅖ to 2⅞; A. III, 12, 1, third spine 3⅞ to 4½, second branched ray 2¾ to 2⅘; caudal 1⅔ to 1⅘, hind edge convex; least depth of caudal peduncle 2⅕ to 2⅓; pectoral 1½ to 1⅔; ventral 2 to $2\frac{1}{10}$.

Body drab neutral. Each scale with round gray white spot margined with darker. Head with 3 pale lines from eye, upward, 1 in front forward across front of eye and 2 downward over cheek; also 1 from suprascapula toward eye, then down vertically on preopercle; several lines on cheek continued down over interopercle; opercle and subopercle with 5 or 6 oblique pale lines. Vertical fins all with small, crowded pale dots, edges of fins narrowly whitish or greenish. Pectoral pale brown, base deep dusky brown. Ventral brownish, front edge narrowly greenish with submarginal dusky line.

Red Sea, Mauritius and East Africa to the East Indies and Tahiti. Variation is noticeable in the spots on the chest, breast, and side of the abdomen, which sometimes elongated as streaks or variably may extend over several scales. Lines on head variable, often broken or variously incomplete.

5677 and 5678. Cabugan Grande Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 195 to 200 mm. [1776 and 1777.] Agrees in general with Günther's figure. Side dark olive, reddish shades very dark vinaceous below, somewhat paler above but not so bright as shown; blue stripes on head much brighter and pattern differing irregularly; blue spots similar to stripes in color; spots of anal short dashes crossing membranes, except first two or three central which round dots, as shown by Günther; blue margin rests on very narrow black line, both dorsal and anal; basal row of spots on dorsal duplicated, making dumbbell-shaped blotches; spots on outer portion of fin smaller than shown, all with darker rims; spots of caudal also smaller, tip of fin hyaline; body pale green and not reddish as shown. Pectorals hyaline olive. Ventrals vermilion, with blue spots on front and third and fourth rays.

11204. West Island, Palumbanes Group. June 11, 1909. Length, 170 mm. Very dark olive green; in center of each scale bright blue round spot about size of No. 9 shot; surrounding this shade or umbra of dark brown; these tend to fuse forming dark stripe through center of scale rows; breast and belly strongly washed with vermilion spots, becoming irregular on breast, with less shading; top and side of head similar to body, crossed by narrow blue stripes defined by brownish, similar to that on scale spots; four of these across cheek parallel to hinder limb of opercle, first very short extends forward not reaching top of snout; similar stripe lies along premaxillary across snout; second cheek bar extends across preorbital almost to contour of snout; third breaks across eye and crosses forehead from eye to eye above, fourth lies just within preopercular limb, curves backward around upper edge of opercle; horseshoe lies on front of opercle and about four more or less irregularly placed short dashes on remainder of surface; interopercle spotted with blue; double blue line lies along throat; chin and throat more or less washed with vermilion over ground-color. Dorsal and anal similar to ground of body but with strong reddish shade; front margins bright blue, resting on very narrow black line; at base of each membrane short dash of blue, shaded as body spots; central body of dorsal numerously spotted with very small blue centered spots similar to those on body except in size. Anal, ground more purplish shade, carries single row of spots through center, almost without darker rim, owing to darkness of body ground. Caudal similar to body, spots very small and mostly on rays; tip of fin hyaline, and paler band submarginal to this. Ventrals dark vermilion, becoming orange and hyaline posteriorly, front blue; few blue specks on body. Pectorals dusky hyaline olive, blue bar at base of rays and dash on base of upper ray.

19075. Silino Island. August 10, 1909. Length, 166 mm. [1813.] Body color olive, spots cerulean blue, surrounded by blackish ring, these connecting into stripes more or less on lower body. Verticals with vinaceous tone, less marked on caudal. Pectorals dark at base.

52428 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 146 to 259 mm. 4 examples.

71657 U.S.N.M. Japan. Bureau of Fisheries. Length, 185 to 210 mm. 2 examples.

ANAMPSES DIADEMATUS Rüppell

Anampses diadematus Rüppell, Neue Wirbelth., Fisch., 1835, p. 21, pl. 6, fig. 3. Tor, Red Sea.—Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 14 (Red Sea).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 137 (copied); Fishes of Zanzibar, 1866, p. 91 (Zanzibar, Aden).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 533 (Koseir, Red Sea).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius and Seychelles).—Günther, Philos. Trans. Roy. Soc., vol. 168, 1879, p. 470 (Rodriguez); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 252, pl. 139 (Misol, Samoa, Gilbert Islands, Huahine, Paumotus).

Anampses taeniatus Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 457 (on *Anampsès à bandes* Liénard, Treiz. Rapp. Soc. hist. nat. Maurice, 1843, p. 86, Mauritius).

Depth 2½ to 2⅔; head 2⅗ to 2¾, width 2¼. Snout 2⅓ to 2⅖; eye 8, 3⅓ to 3½ in snout, 2 to 2⅙ in interorbital; maxillary ½ to ⅗ to eye, 3½ to 3⅞ in head; interorbital 3⅔ to 3⅞, convex. Gill rakers 8+11, lanceolate, short.

Scales in lateral line 22 or 23, 5+2 or 3; 7 or 8 scales above lateral line, 11 below, 10 to 12 predorsal. Scales with 17 to 20 basal radiating striae; obsolete apical radiating striae 40 to 43; circuli fine.

D. IX, 11, 1 or 12, 1, ninth spine 4⅛ to 4⅔ in head, first branched ray 2⅞ to 3⅙; A. III, 12, 1, third spine 4⅔ to 5⅗, first branched ray 2⅘ to 3½; caudal 1⅗ to 1¾, truncate, slightly convex as expanded; least depth of caudal peduncle 2¼ to 2⅔; pectoral 1⅗ to 1⅘; ventral 2⅛ to 2¼.

Deep vandyke brown generally, each scale with vertical pale or grayish line and on small scales as gray or pale spots. Buff line across interorbital from one eye to other. Dorsals brown, edged narrowly buff or greenish and on median part of rayed fin small gray ocelli with dark ring-like borders. Anals dull brown, with median marginal greenish longitudinal bands. Caudal brownish, with greenish marginal and median tints and with small gray spots. Pectoral base brown, like trunk, fin pale brownish medianly and pale greenish terminally and marginally. Ventral brown, front edge and some spots obscurely greenish. Iris pale brown.

Red Sea, East Africa, and Mauritius to the East Indies and the Paumotus. Neither Rüppell or Günther show the caudal fin spotted.

8769. Lahuy Island. June 11, 1909. Length, 263 mm.
A983. Binang Unang Island, Celebes. November 17, 1909. Length, 220 mm.

Genus STETHOJULIS Günther

Stethojulis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 140. Type *Julis strigiventer* Bennett, designated by Jordan, Genera of Fishes, vol. 3, 1919, p. 308.

Hinalea Jordan and Jordan, Mem. Carnegie Mus., 1923, p. 69. Type *Julis axillaris* Quoy and Gaimard, orthotypic.

Body oblong, compressed. Mouth small. Canines small, close-set, upper short, lower as cutting edge; large posterior canine each side. Scales large, 25 to 30 in lateral line. Head scaleless. Scales on chest and breast usually enlarged. Lateral line complete. Fins low. Dorsal spines short and pungent, 9, rays 11. Anal spines 3, rays 11. Caudal convex or truncate behind.

Small reef fishes of the Indo-Pacific, brilliant and ornate. Some of the species are so constant in their association as to suggest they may be sexually dimorphic.

ANALYSIS OF THE SPECIES

*a*¹. Stethojulis. Thoracic scales but slightly enlarged; flanks below with small white spots or longitudinal bands, latter when present above median axis of body incomplete.

*b*¹. Lower flanks with many longitudinal rosy bands; pectoral base without band or spot; small black ocellus on last dorsal rays and another at bases of upper caudal rays ..... strigiventer.

b^2. Lower flanks with scales edged pearly; pectoral base with transverse violet band; caudal peduncle with 2 small black spots, ocellated with blue ..... **axillaris.**

b^3. Lower flanks with longitudinal rows of small white spots; body above with blue dots.

c^1. Dorsal dotted blue; pectoral base with transverse violet band; caudal with brown median basal spot ..... **phekadopleura.**

c^2. Dorsal with oblique blue streaks; pectoral and caudal bases without band or blotch ..... **kalosoma.**

b^4. Band below pectoral base longitudinally reaches only little beyond pectoral base ..... **interrupta.**

a^2. RHYTEJULIS, new subgenus. Thoracic scales greatly enlarged; back, head and middle of side at least with narrow rose-violet longitudinal bands.

d^1. No band below pectoral; inferior body band extends from pectoral axil to caudal base ..... **albovittata.**

d^2. Band below pectoral begins at gill-opening and reaches opposite anal origin ..... **renardi.**

d^3. Band from snout to caudal passes above pectoral and reaches caudal base ..... **trilineata.**

Subgenus STETHOJULIS Günther

Thoracic scales little larger than others. Lower flanks with longitudinal bands or small white spots. When present, longitudinal bands above median axis of body incomplete.

STETHOJULIS STRIGIVENTER (Bennett)

Julis strigiventer BENNETT, Proc. Comm. Zool. Soc. London, 1832, p. 184. Mauritius.—PETERS, Arch. Naturg., 1855, p. 263 (Mozambique).

Stethojulis strigiventer BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 135, pl. 43, fig. 1 (Bawean, Singapore, Lepar, Biliton, Celebes, Ternate, Buru, Amboina, Ceram, Banda, Timor, Letti).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 140 (Mauritius, Mozambique, Amboina, Port Essington).—KNER, Reise Novara, Fisch., vol. 2, 1865, p. 252 (Pujnipet).—GÜNTHER, Fishes of Zanzibar, 1866, p. 92 (Zanzibar).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, 1876, p. 345 (Low Island, Queensland).—DAY, Fishes of India, pt. 3, 1877, p. 397, pl. 84, fig. 7 (Andamans).—GÜNTHER, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 254 (Pelew Islands, Fiji, Vavau, Samoa, Ponape, Wallis Island, East Africa).—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu).—DAY, Fauna British India, vol. 2, 1889, p. 403, fig. 138.—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 551 (Cebu).—ISHIKAWA and MATSUURA, Prelim. Cat. of Mus. Tokyo, 1897, p. 29 (Japan).—STEINDACHNER, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 442 (Ternate).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 63 (Riu Kui).—JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 265 (Cuyo).—FRANZ, Abhandl. K. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, 1910, p. 53 (Yokohama).—WEBER, Abhandl. Senckenberg. Gesell., vol. 34 (1), 1911, p. 8 (Kei Islands).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 420 (Tanegashima), p. 507 (Okinawa).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 370 (Rotti).—FOWLER, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 3⅖ to 3½; head 2¾ to 2⅘, width 2⅓ to 2½. Snout 2⅞ to 3; eye 5 to 5⅓, 1⅘ to $1\frac{9}{10}$ in snout, 1⅛ to 1⅓ in interorbital; maxillary reaches ⅔ to ¾ to eye, 4⅕ to 4⅖ in head; interorbital 4⅕ to 4¾, broadly convex. Gill rakers 7+14, short, cuneate.

Scales in lateral line 19, 5 or 6+2; 3 scales above lateral line, 8 or 9 below, 6 or 7 predorsal. Scales with 18 basal radiating striae, 8 to 12 apical; circuli fine.

D. IX, 11, 1, ninth spine 3⅘ to 4⅙ in head, first ray 3; A. II, 11, 1, second spine 5⅓ to 6, first ray 3½ to 3⅞; caudal 1⅖ to 1½, convex behind; pectoral 1½ to 1⅗; ventral 2⅖ to 2⅗.

Back brown, lower sides and under surfaces whitish. Back finely mottled or vermiculated with darker, on top of head and predorsal also minute dusky specks and dots. Dark color of head above divided from whitish below by dusky streak from snout end close along lower eye edge toward pectoral origin. Along flanks, level from pectoral base, 6 longitudinal narrow white lines, of which 3 or 4 extend to caudal peduncle. Within dark intervening bands row of deep or dusky brown dots, not evident in small examples. Eye brown, lips pale to whitish. Dorsals grayish, little deeper basally, small black ocellus at last rays. Anals pale or whitish. Caudal pale, with small blue black ocellus at bases of upper median rays and 5 or 6 transverse brown cross-bands. Paired fins pale.

Mauritius, East Africa, East Indies, Japan, Queensland, Melanesia, Micronesia, Polynesia.

1 example, Bolalo Bay, Palawan Island. December 21, 1908. Length, 50 mm.
9 examples, Bolalo Bay. December 24, 1908. Length, 45 to 83 mm.
22497. Bolinao, Eastern Luzon. May 9, 1909. Length, 65 mm.
22420. Butauanan Island, Eastern Luzon. June 12, 1909. Length, 75 mm.
3 examples, Cebu market. September 3, 1909. Length, 73 to 92 mm.
1 example, Danawan Island and Si Amil Island. September 27, 1909. Length, 76 mm.
1 example, Guijulugan Island, Negros. April 2, 1908. Length, 49 mm.
1 example, Jolo. March 7, 1908. Length, 112 mm. [425.] Dark sage green on top of head and back; toward middle of side head and body with each scale more or less vermiculated with pale olive lines; below middle pale olive lines follow between rows of scales, lines become silvery toward belly; lower head and breast white; scales between pale lines with longitudinal dark line, becoming mere specks below; dark line from tip of snout under eye straight across opercle and separating head colors; second short line below on opercle. Dorsal washed with lemon yellow terminally, spines and rays dusky. Soft anal hyaline at tip. Caudal dark olive green, paler on edges, yellowish above and smoky below; medianly crossed transversely with 6 bluish white bars. Pectoral very pale straw yellow. Anal and ventrals colorless. Iris color of adjacent region.
8 examples, Lagonoy Island, Eastern Luzon. July 18, 1909. Length, 68 to 82 mm.
6 examples, Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 60 to 72 mm.

13892, 22601, and 22602. Observatory Island. December 19, 1908. Length, 60 to 91 mm. [954.] Olive green above; black stripe under eye, bluish white below; lower half pale ocher wash; stripes on lower side alternately dusky and ocher; dusky continues above, but lost in green. Caudal with bronzy bars; small black blotch at base. No markings on dorsal or anal.

17244 and 17245. Pandanon Island. March 24, 1909. 7 examples. Length, 68 to 94 mm.

1 example, Pandanon Island. May 24, 1909. Length, 78 mm.

11 examples, Port Caltom. December 15, 1908. Length, 59 to 73 mm.

9 examples, Port Matalvi. November 23, 1908. Length, 42 to 74 mm.

21310. Romblon. March 26, 1908. Length, 82 mm.

5 examples, San Pascual, Burias Island. March 8, 1909. Length, 27 to 56 mm.

2 examples, Simaluc, Bisibisi Island. September 23, 1909. Length, 40 mm.

28 examples, Tara Island. December 5, 1908. Length, 27 to 70 mm.

1 example, Tataan Island, shore reef. February 20, 1908. Length, 65 mm. [239]. Upper half of body and head bright green, with light streak from snout, over eye, to upper base of caudal; lower part of green with fine darker green stripes, of which 4 appear on silvery white of under parts; small black spot on caudal peduncle over lateral line. Dorsal rays amber yellow, membranes hyaline at bases and amber at ends, tips of rays and membranes colorless; small black spot at base of penultimate ray. Caudal hyaline, with 3 yellow cross bars and general yellow distal part. Anal, ventrals and pectorals hyaline, unmarked.

20865 and 20866. Tumindao Island. February 25, 1908. Length, 60 to 88 mm.

4 examples, Ulugan Bay, near Baheli River mouth. December 28, 1908. Length, 78 to 94 mm.

13 examples, Varadero Bay, Mindoro. July 23, 1908. Length, 57 to 76 mm.

1 example, Basa Reef, Gulf of Boni, Celebes. December, 17, 1909. Length, 34 mm.

66040 U.S.N.M. Wotje Atoll, Marshall Islands. *Albatross* collection. Length, 85 mm. 1 example.

66041 U.S.N.M. Moen, Carolines. *Albatross* collection. Length, 36 to 60 mm. 11 examples.

17258 U.S.N.M. Nafa, Okinawa, Riukiu. *Albatross* collection. Length, 47 to 68 mm. 6 examples.

71235 U.S.N.M. Tanegashima, Japan. Bureau of Fisheries. Length, 52 mm. 11 examples.

71261 U.S.N.M. Tanegashima. Bureau of Fisheries. Length, 35 to 72 mm.

71564 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 25 to 68 mm. 35 examples.

72252 U.S.N.M. Cuyo, Philippines. R. C. McGregor. Length, 100 mm. 1 example.

48633 to 48635 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 48 to 73 mm.

STETHOJULIS AXILLARIS (Quoy and Gaimard)

Julis axillaris Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 72. Hawaiian Islands.—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.

Stethojulis axillaris Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 136, pl. 44, fig. 7 (Java, Celebes, Ternate, Banda, Goram, Timor, Letti).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 142 (Madagascar).—Bleeker, Ned. Tijds. Dierk., vol. 1, 1863, p. 344 (Madagascar).—Günther, Fishes of Zanzibar, 1866, p. 93 (Zanzibar and Johanna).—Klunzinger,

Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 541 (Koseir, Red Sea).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 254, pl. 136, fig. C (East Africa, East Indies, Pelew Islands, Solomons, Fiji, Society Islands, Hawaii, New Hebrides, Ponapé).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Sangi).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 283, fig. 121 (Honolulu, Hilo).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1910, p. 442 (Ternate).—Weber, Abhandl. Senckenberg. Gesell., vol. 39 (1), 1911, p. 7 (Kei Islands).—McCulloch, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 423 (Murray Island, Queensland).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 369 (Siau, Beo, Binongka, Nusa Laut, Elat, Roma, Timor, Rotti).

Julis (*Halichoeres*) *bandanensis* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 254. Neira, Banda.

Stethojulis bandanensis Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 787 (Negros); Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 297, pl. 45, fig. 2 (Apia and Pago Pago, Samoa); Proc. U. S. Nat. Mus., vol. 26, 1906 (1907), p. 30 (Cavite).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Cuyo and Cagayancillo).

Stethojulis fulvoventris Seale, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 92. Agaña, Guam.

Depth 2⅘ to 3⅓; head 2⅘ to 3, width 2$\frac{1}{10}$ to 2¼. Snout 2⅘ to 3$\frac{1}{10}$; eye 4⅖ to 5¼, 1⅕ to 1⅘ in snout, 1 to 1⅔ in interorbital; maxillary ½ to ¾ in snout, 1 to 1⅔ in head; interorbital 3⅞ to 4¼, convex. Gill rakers 8+17, short, cuneate points.

Scales in lateral line 18 to 21, 4+1 or 2; 3 scales above lateral line, 8 or 9 below, 7 or 8 predorsal. Scales with 13 to 15 basal radiating striae, apical 13 to 15; circuli very fine.

D. IX, II, 1, ninth spine 3⅙ to 3⅔ in head, first ray 2½ to 2⅘; A. II, 11, 1, second spine 4 to 4⅘, first ray 2⅞ to 3⅛; caudal 1⅓ to 1⅔, convex behind; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅓; pectoral 1¼ to 1⅔; ventral 2 to 2¼.

Brown generally, occiput and back finally dotted gray. Brown band, little darker than body color, from side of snout to eye then back across head and dividing pale or whitish of under surface from pectoral axil. One, sometimes 2 or 3 small black inconspicuous ocelli at median axis of caudal basally, last largest. Each scale on abdomen and belly whitish on terminal half of exposure. Iris brown. Fins all pale brown. Pectoral with deep dusky brown base. Just above pectoral origin a conspicuous white spot.

East Africa, Madagascar, East Indies, Queensland, Melanesia, Micronesia, Polynesia, Hawaii.

22498. Bolinao, Eastern Luzon. May 9, 1909. Length, 79 mm.

20099 and 20102. Cagayan, Sulu Island. January 8, 1909. Length, 70 to 74 mm. [1066.] Ground color on top of head purplish, becoming olive on back, everywhere peppered with minute white or gray specks, these smallest in interorbital region and larger on back; lower half of head and body becoming white with more or less smoky bluish at bases of scales; bright lemon yellow bar

from beneath eye to corner of mouth; behind opercular flap above base of pectoral a bright orange blotch, slightly smaller than eye; one or two black centered ocelli in middle of peduncle. Dorsal fin olive yellow, hyaline, peppered with small spots similar to back; extreme margin dusky hyaline, with purplish shade below. Caudal yellowish. Anal hyaline. Ventrals hyaline. Pectoral very pale hyaline olive, with black bar at base, shades of purple below.

13482. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 80 mm.

11504. Sulade Island. September 17, 1909. Length, 103 mm. [1944.] Top of head and back very dark olive, abdundantly specked with pale bluish-white; distinct demarking line from snout passes under eye and backward along middle of side; near middle of peduncle on this line small black centered pale rimmed ocellus, duplicated in this specimen on right side; under line of demarkation on cheek (not preorbital), a broad yellowish wash; cheek and opercle behind olive; below on interopercle and throat whitish, with slight pink wash; breast and belly sulphur with pink overshade and on belly and above ventrals scales with pale slaty base; above silvery and below the damarking line brownish wash covers gray. Pectoral axil and base blackish, set off by bright irridescent green lines, above which broader orange stripe. Dorsal olive, with pale specks ,similar to back but much paler, margin hyaline without color in soft fin. Caudal pale olive, without specks. Ventrals same. Pectoral rays slightly dusky.

9416. Midway Reefs, Polynesia. November 7–8, 1907. Length, 118 mm.

5394 U.S.N.M. Honolulu Harbor. Dr. T. H. Streets. Length, 57 to 111 mm. 7 examples.

55221 U.S.N.M. Hawaiian Islands. Length, 98 to 100 mm. 2 examples.

55222 to 55232 U.S.N.M. Honolulu Reef, Hawaiian Islands. May 8, 1902. Length, 20 to 65 mm. 31 examples.

55358 U.S.N.M. Hawaiian Islands. Dr. T. H. Streets. 1902. Length, 87 to 113 mm. 6 examples.

55564 U.S.N.M. Hawaiian Islands. *Albatross* collections. Length, 55 mm. 1 example.

71234 U.S.N.M. Tanegashima, Japan. Bureau of Fisheries. 1906. Length, 31 to 78 mm. 3 examples.

52034 U.S.N.M. Negros. Dr. B. Dean. Length, 63 mm. 1 example.

52211 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 70 to 82 mm. 7 examples.

66039 U.S.N.M. Wotje Atoll, Marshalls, 2 examples; Arno Atoll, 3 examples. Length, 80 to 88 mm.

66092 U.S.N.M. Samoa. Bureau of Fisheries. Length 38 to 47 mm. 3 examples.

72247 U.S.N.M. Cagayancillo, Philippines. R. McGregor. Length, 58 mm. 1 example.

9407 to 9414 A.N.S.P. Oahu. Dr. W. H. Jones. Length, 33 to 111 mm.

9415 to 9418 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend.

28229 A.N.S.P. Honolulu. Stanford University.

29709 and 29710 A.N.S.P. Honolulu. Stanford University.

17195 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 95 mm.

31065 A.N.S.P. Apia. Bureau of Fisheries. Length, 60 to 75 mm.

STETHOJULIS PHEKADOPLEURA (Bleeker)

Julis (*Halichoeres*) *phekadopleura* Bleeker, Verh. Batav. Genootsch. (Bali), vol. 22, 1849, p. 8. Boleling, North Bali.

Stethojulis phekadopleura Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 134, pl. 43, fig. 5 (Java, Bawean, Bali, Sumatra, Nias, Borneo, Celebes, Sangi, Ternate, Amboina, Ceram, Timor, Letti).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 143 (East Indies); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 255 (Solomons and Ponapé).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (New Guinea).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 787 (Negros); Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 297, fig. 52 (Pago Pago and Apia); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 30 (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 265 (Cuyo and Calayan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 420 (Tanegashima), p. 516 (Okinawa).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 369 (Savu, Beo, Obi major, Saleyer, Nusa Laut, Tiur).

Stethojulis phecadopleura Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina R.).

Julis leucostictus (Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 134 (name in synonymy).

Stethojulis filholi Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 4, 1879, p. 225. Fiji.

Stethojulis trossula Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 633, fig. 7. Misaki.—Franz, Abhandl. K. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, 1910, p. 53, pl. 9, fig. 67 (Misaki).

Depth 2⅘ to 3; head 2¾ to 3, width 2⅕ to 2⅘. Snout 2⅘ to 3; eye 5 to 5⅕, 1⅗ to 1⅘ in snout, 1⅙ to 1⅕ in interorbital; maxillary reaches ⅗ to eye, 4⅔ to 5 in head; interorbital 4 to 4⅞, slightly convex. Gill rakers 5+11, short points.

Scales in lateral line 20, 4+2; 3 scales above lateral line, 8 below, 7 predorsal. Scales with 14 or 15 basal radiating striae, 11 to 14 apical; circuli fine.

D. IX, 11, 1, ninth spine 3⅖ to 3 ⅘ in head, first ray 2½ to 2⅞; A. III, 11, 1, third spine 4 to 4⅕, first ray 2⅞ to 3; caudal 1¼ to 1⅓, convex behind; least depth of caudal peduncle 2⅓ to 2½; pectoral 1⅖ to 1¾; ventral 2⅕ to 2⅖.

Brown above, below white. Back and head above all finely dotted with gray white; though dots more numerous on head above. Pale horizontal streak from side of snout to pectoral origin and then back along lower side of body separates equally broad brownish longitudinal streak. Along lower side of abdomen and tail each scale with a distinct dark rounded spot forming 3 rows, these spots much larger than those of back. Slight deep brown blotch at caudal base nearly large as eye. Fins pale brownish. Dorsals finely dotted with grayish. Anal and ventral whitish terminally. Iris pale brownish.

East Indies, Philippines, Riu Kiu, Japan, Melanesia, Polynesia.

2 examples, Bolalo Bay, Palawan Island. December 21, 1908. Length, 70 to 80 mm.

15320 and 15321. Cebu market. March 19, 1909. 4 examples. Length, 97 to 110 mm.

5100 to 5103. Cebu market. April 5, 1908. Length, 70 to 98 mm.

1 example, Gulf of Luzon. April 2, 1908. Length, 84 mm.

11424. Nogas Point, Panay. February 4, 1908. Length, 69 mm.

1 example, North end of Endeavor Strait, northwest coast of Palawan. December 25, 1908. Length, 75 mm.

1 example, Rosa Island anchorage, Lagonoy Gulf, Luzon. June 16, 1909. Length, 75 mm.

11112 and 18167. Sablayan, Mindoro. December 13, 1908. 7 examples. Length, 53 to 105 mm. [771.]

52046 U.S.N.M. Negros. Dr. B. Dean. Length, 61 mm.

52393 U.S.N.M. Apia. Bureau of Fisheries. Length, 31 to 83 mm. 11 examples.

72202 U.S.N.M. Calayan. R. C. McGregor. Length, 42 to 43 mm. 2 examples.

72270 U.S.N.M. Cuyo. Length, 62 mm. 1 example.

56085 U.S.N.M. Bacon. Length, 51 mm. 1 example.

31059 to 31061 A.N.S.P. Apia. Bureau of Fisheries. Length, 45 to 54 mm.

27705 to 77711 A.N.S.P. Padang. Messrs. Harrison and Hiller. Length, 43 to 97 mm.

STETHOJULIS KALOSOMA (Bleeker)

Julis (*Halichoeres*) *kalosoma* BLEEKER, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 289. Amboina and Wahai, Ceram.

Stethojulis kalosoma BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 134, pl. 43, fig. 4 (Java, Bawean, Bali, Sumatra, Nias, Celebes, Sangi, Ternate, Buru, Amboina, Ceram, Banda, Goram).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 543 (Koseir, Red Sea).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 369 (Sarasa, North Ubian in Sulu Archipelago, Saleyer, Elat).

Stethojulis kalosoma GÜNTHER, Cat.Fish. Brit. Mus., vol. 4, 1862, p. 142 (Madagascar); Fishes of Zanzibar, 1866, p. 94 (Zanzibar).—ELERA, Cat. Fauna Filip., 1, 1895, p. 552 (Luzon, Manila Bay).—JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 787 (Negros); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 37 (Cavite).—WEBER, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Islands).—MCCULLOCH, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 606 (Murray Island, Queensland).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 420 (Misaki).—SEALE, Philippine Journ. Sci., vol. 9, 1914, p. 70 (Hong Kong).—FOWLER, Proc. Acad. Nat. Sci. Phila., 1925, p. 259 (Delagoa Bay, East Africa).

Stethojulis terina JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 631, fig. 6. Misaki Wakanoura, Kominato.—FRANZ, Abhandl. K. Bayer, Akad. Wiss., vol. 4, Suppl. vol. 3, 1, 1910, p. 52 (Yagoshima).

Stethojulis zatima JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 788, fig. 7. Negros.—EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Cuyo and Calayan).

Depth 3⅞ to 4; head 2⅘ to 2⅞, width 2½ to 2⅗. Snout 2⅘ to 3¼; eye 5 to 5¼ (3¼ in young), 1⅔ to 2⅞ (1 in young) in snout, 1⅛ to 1⅕ in interorbital; maxillary reaches ⅔ to ¾ to eye, 4 to 4½ in head; interorbital 4⅕ to 5, broadly convex. Gill rakers 3+12, short points.

Scales in lateral line 19 to 21, 4 or 5+2; 3 scales above lateral line, 9 below, 9 predorsal. Scales with 12 to 17 basal radiating striae, apical 12 or 13; circuli fine.

D. IX, 11, 1, ninth spine 3¼ to 3¾ in head, first ray 2⅘ to 3⅛; A. II, 10, 1, or 11, 1, second spine 5 or 6, first ray 3⅖ to 4; caudal 1⅗ to 1⅔, convex behind; least depth of caudal peduncle 3¾ to 4; pectoral 1½ to 1⅔; ventral 2⅙ to 2½.

Brown above, finely vermiculated, spotted or varied with darker. Lower half of body whitish, each scale on abdomen above and tail above anal, with dark round spot and several smaller marginals. Dark, ill-defined median lateral streak divides contrasted colors and on side of head adjoining white line. Iris whitish. Dorsals all finely dotted with deeper brown, other fins pale.

Red Sea, East Africa, Madagascar, East Indies, Queensland, Melanesia, Japan.

1 example, Atulayan Bay. June 17, 1909. Length, 63 mm.
22570. Bagatao Bay, Eastern Luzon. March 12, 1909. Length, 56 mm.
22598. Bolalo Bay, Eastern Luzon. December 20, 1908. Length, 74 mm.
19854. Cataingan Bay, Masbate. April 18, 1908. Length, 73 mm.
2 examples, Cebu market. March 20, 1909. Length, 68 to 82 mm.
2 examples, Cebu market. September 3, 1909. Length, 100 to 103 mm.
6 examples, Cebu market. September 4, 1909. Length, 27 to 37 mm.
1 example, Great Tobea Island. December 15, 1909. Length, 58 mm.
1 example, Gulf of Luzon. April 2, 1908. Length, 56 mm.
2 examples, Guijulugan, Negros. April 2, 1908. Length, 22 to 27 mm.
D. 5145. Jolo Light, Philippines. February 15, 1908. 1 example. Length, 76 mm. [89.]
4 examples, Maculabo Island. June 14, 1909. Length, 38 to 55 mm.
22399. Mahinog, Camiguin Island. August 3, 1909. Length, 50 mm.
22358. Masamat Bay, Quinalasag Island. June 14, 1908. Length, 70 mm.
17240 to 17243, 19312. Pandanon Island. March 24, 1909. 23 examples. Length, 70 to 94 mm. [1445.] Top of head and back dark olive; yellow stripe from snout under eye to below point of opercle; opercle above brownish; from point of opercle to base of caudal an irregular dusky blackish stripe dividing ground color of body; below white, with numerous black specks posteriorly. Dorsal pale olive, with numerous paler specks. Caudal with slight orange wash. Other fins hyaline. Pectoral slightly yellowish.
2 examples, Pandanon Island. May 24, 1909. Length, 78 to 85 mm.
1 example, San Pascual Bay, tide-pools 6 miles south. March 8, 1909. Length, 64 mm.
20306. Santa Cruz Island, Marinduque. April 24, 1908. Length, 63 mm.
1 example, Tara Island. December 15, 1908. Length, 42 mm.
1 example, Tobea Island. December 15, 1909. Length, 34 mm.
1 example, Varadero Bay, Mindoro. July 23, 1908. Length, 59 mm.
52008 U.S.N.M. Negros. Dr. B. Dean. Length, 63 mm. 1 example.
72235 U.S.N.M. Calayan. R. C. McGregor. Length, 18 to 28 mm. 3 examples.
56086 U.S.N.M. Bacon. Length, 47 mm. 1 example.

50243 U.S.N.M. Misaki, Japan. Jordan and Snyder. Length, 110 mm. 1 example. Cotype of *Stethojulis terina.*

50247 U.S.N.M. Wakanoura. Jordan and Snyder. Length, 98 mm. 1 example.

51943 U.S.N.M. Negros. Dr. B. Dean. Type of *Stethojulis zatima.*

STETHOJULIS INTERRUPTA (Bleeker)

Julis (*Halichoeres*) *interruptus* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 252. Neira, Banda.

Stethojulis interruptus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 133, pl. 44, fig. 5 (Bali, Celebes, Solor, Timor, Ternate, Buru, Amboina, Ceram, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 142 (Amboina).

Stethojulis interrupta Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 543 (Koseir, Red Sea).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina River).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore and Kobe).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Sangi).—Boulenger, Proc. Zool. Soc. London, 1889, p. 240 (Muscat).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Ambon).—Beaufort, Bijd, Dierk. Amsterdam, 16, 1913, p. 132 (Amboina).—Fowler, Proc. Acad. Nat. Sci. Phila., 1925, p. 259 (Delogoa Bay. East Africa).

Depth 3⅔ to 3¾; head 2¾ to 2⅞, width 2¼ to 2⅔. Snout 2⅞ to 3¼; eye 5¼ to 6, 1¾ to 1⅞ in snout, 1⅕ to 1⅖ in interorbital; maxillary reaches ⅗ to ⅔ to eye, 4⅔ to 5 in head; interorbital 4⅔ to 4⅞, broadly convex. Gill rakers 7 + 15, short points.

Scales in lateral line 20, 5 or 6 + 1; 2 scales above lateral line, 8 below, 10 predorsal. Scales with 20 to 29 basal radiating striae, apical 11 to 14; circuli very fine.

D. IX, 11, 1, ninth spine 4 to 4⅛ in head, first ray 3⅛ to 3⅙; A. III, 11, 1, third spine 5 to 6⅕, first ray 3½ to 3⅘; caudal 1⅖ to 1⅗, rounded convexly behind; least depth of caudal peduncle 3⅙ to 3⅘; pectoral 1½ to 1⅗; ventral 2⅓ to 2⅖.

Back plumbeous to slate gray anteriorly, paler posteriorly and below whitish. From each side of occuput, though sometimes forward from upper hind eye edge, narrow whitish line back along dorsal bases and upper edge of caudal peduncle, falling finally to bases of upper median caudal rays. Second whitish band across middle of snout to eye, then back to suprascapula to enclose bluish blotch on opercular flap. Also short white oblique bar above whitish lower humeral region. Third whitish band from upper lip edge back along lower eye edge and then to pectoral origin, then back little below middle of side to median lower caudal rays. This band variously interrupted medianly. Also short whitish horizontal line along and close below pectoral base. Iris pale yellowish. Fins all uniformly pale. Neutral black spot at pectoral origin. Smaller examples with scales of side often with deep gray basal spot, both above and below pale longitudinal line.

Red Sea, East Africa, East Indies.

15327. Cebu market. March 19, 1909. Length, 72 mm.
1 example, Cebu market. March 28, 1909. Length, 88 mm.
6097. Cebu market. August 12, 1909. Length, 118 mm.
17258 to 17260. Pandanon Island. March 24, 1909. 7 examples. Length, 77 to 97 mm.
16271 Teomabal Island. September 18, 1909. Length, 101 mm.
56410 U.S.N.M. China. P. L. Jouy. Length, 130 mm. 1 example.

RHYTEJULIS, new subgenus

Type.—Labrus trilineatus SCHNEIDER.

Thoracic scales well enlarged, in contrast with others of body. Sides above with rose violet, longitudinal narrow bands, often fading white or yellow in spirits.

(Ῥυτήρ, rein; *Julis*, with reference to rose violet narrow longitudinal bands.)

STETHOJULIS ALBOVITTATA (Bonnaterre)

Labrus albovittatus BONNATERRE, Tabl. Ichth., 1788, p. 108, pl. 98, fig. 399. No locality. (On KOELREUTER.)

Stethojulis albovittata BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 132, pl. 44, fig. 6 (Java, Sumatra, Nias, Batu, Bali, Celebes, Sangi, Ternate, Buru, Banda, Goram, Letti).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 141 (Madagascar, Amboina, Hawaiian Islands).—BLEEKER, Ned. Tijds. Dierk., vol. 1, 1863, p. 344 (Madagascar).—GÜNTHER, Fishes of Zanzibar, 1866, p. 93 (Zanzibar).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 542 (Kosier, Red Sea).—GÜNTHER, Journ. Mus., Godeffroy, vol. 7 (15), 1881, p. 256, pl. 141, fig. B (Hawaiian Islands).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 552 (Cebu coast).—JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 284, pl. 26 (Honolulu).

Julis balteatus QUOY and GAIMARD, Voy. Uranie Zool., 1824, p. 267, pl. 56, fig. 1. Maui, Hawaiian Islands.—GUICHENOT, Notes I. Reunion, vol. 2, 1862, p. 28.

Depth 2⅞ to 3¼; head 2⅞ to 3, width 2⅙ to 2⅓. Snout 2⅕ to 3; eye 5 to 6, 1⅔ to 2⅛ in snout, 1⅓ to 1½ in interorbital; maxillary reaches ⅗ to ¾ to eye, 4 to 4½ in head; interorbital 4⅕ to 4¼, convex. Gill rakers 10+20, short points.

Scales in lateral line 20 to 22, 5 or 6+2; 3 scales above lateral line, 8 or 9 below, 7 to 10 predorsal. Scales with 13 to 15 basal radiating striae, apical 12 to 13; circuli very fine.

D. IX, 11, 1, ninth spine 3⅖ to 3⅗ in head, first ray 2¾ to 3; A. II, 11, 1, second spine 4¼ to 5⅛, first ray 3⅕ to 3⅗; caudal 1⅗ to 1¾, rounded behind; least depth of caudal peduncle 2½ to 3⅕; pectoral 1⅖ to 1⅗; ventral 2¼ to 2¾.

Back slaty to plumbeous, below pearl gray to whitish. Narrow white band from midway in snout to eye, then from behind eye up and along each side of dorsal bases. Another short, white, narrow band from hind eye edge back over suprascapula till opposite front of pectoral. Third white band from near hind end of maxillary, along lower eye edge and across opercle and humeral region, then sloping

down and ending opposite vent. Lowest narrow white band across mandible, then curves down behind level of eye to gill opening; extends up along gill opening to whitish axillary region, then slopes down behind pectoral axil until inferior along side of tail, finally gradually ascending to caudal base and out over caudal medially or nearly so. Fins pale brownish, ventral and anal paler.

Red Sea, Zanzibar, Madagascar, East Indies, Polynesia, Hawaii.

15328 to 15332. Cebu market. March 19, 1909. Length, 93 to 99 mm.

21759. Cebu market. March 20, 1909. Length, 97 mm. [1400.] Top of head and back green, becoming much paler below; lower portions more or less lavender; vinaceous stripe at its margin slightly in front of nostrils on midline, passes across preorbital and upper portion of eye just above pupil, thence curves backward on to nape of neck and along base of dorsal to its axil where joining its fellow; another stripe of same color behind middle of eye backward to above first third of pectoral; third stripe from corner of mouth under eye, through point of opercle, thence curving around above base of pectoral and downward under tip of pectoral or last third; fourth stripe across chin from median line, curves through lower part of cheek and downward across interopercle, jumping margin of opercle begins again on edge of gill opening and runs upward to base of pectoral; breaking through pectoral begins again behind base and curves downward, following almost contour of anal region, ending at base of caudal; area between this stripe and third around above base of pectoral scarlet. In alcohol central portion of scales below fourth line and middle part of body above shows darkish, giving rise to obscure stripes. Dorsal fin orange, without bars. Caudal about body color, somewhat greenish at central base opposite long mid stripe of body. Anal pale. Ventrals same. Pectorals pale yellowish.

6 examples, Cebu market. March 23, 1909. Length, 93 to 100 mm.

11502. Sulade Island. September 17, 1909. Length, 107 mm.

16270. Teomabal Island. September 18, 1909. Length, 105 mm.

15139 U.S.N.M. Samoa. Steinberger. Length, 140 mm. 1 example.

51049 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 113 mm. 1 example.

55044 U.S.N.M. Honolulu. *Albatross* collection. Length, 133 mm. 1 example.

9419 and 9420 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 112 to 123 mm.

STETHOJULIS RENARDI (Bleeker)

Julis (*Halichoeres*) *renardi* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 253. Neira, Banda.

Stethojulis renardi Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 132, pl. 43, fig. 2 (Bawean, Sangi, Celebes, Ternate, Buru, Amboina, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 141 (East Indies); Fishes of Zanzibar, 1866, p. 93 (Zanzibar); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 256 (Zanzibar, East Indies, Ponape, Samoa).—Steindachner, Abhandl. Senckenberg. Ges., vol. 25, 1900, p. 442 (Ternate).—Ogilby, Proc. Roy. Soc. Queensland, vol. 21, 1908, p. 23 (Cairns and Dunks Island).

Stethojulis psacas Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 629, fig. 5. Nafa, Riu Kiu.

Depth 3⅓ to 3⅔; head 2⅘ to 2⅞, width 2⅕ to 2⅖. Snout 3 to 3$\frac{1}{10}$; eye 4¾ to 5¾, 1¾ to 2 in snout, 1⅕ to 1¼ in interorbital;

maxillary 4¼ to 5 in head, reaches ⅔ to ¾ to eye; interorbital 4⅕ to 4¼ in head, broad, slightly convex. Gill rakers 9+14, short tubercles.

Scales in lateral line 20 or 21, 5+2; 3 scales above lateral line, 8 or 9 below, 8 to 10 predorsal. Scales with 15 to 17 basal radiating striae, apical 10 or 11; circuli fine.

D. IX, 11, 1, ninth spine 3⅓ to 4⅕ in head, first ray 2⅘ to 3 1/10; A. III, 11, 1 or 12, 1, third spine 5 to 5¾, first ray 3¼ to 4; caudal 1⅔ to 1½, convex behind; least depth of caudal peduncle 2⅞ to 3⅕; pectoral 1⅗ to 1⅔; ventral 2⅕ to 2½.

Back plumbeous to neutral gray, below pearl gray to whitish. Narrow white band from each side of occiput along dorsal bases. Another from nostrils to eye, then back along opercle flap above, partially enclosing neutral black spot less than pupil, and back inside of body to middle of caudal base, at which point small black spot or dot close above. Third narrow whitish band from side of mouth along lower eye edge, then up to pectoral origin and back far as hind end of pectoral base. Also fourth narrow gray band close below and posteriorly till opposite anal origin. All bands with narrow dark bordering lines. Iris yellowish. Fins pale, lower ones whitish.

Zanzibar to the East Indies, Riu Kiu, Queensland, Polynesia, Micronesia.

20763. Cebu market. March 20, 1909. Length, 109 mm.

6098. Cebu market. August 12, 1909. Length, 122 mm.

4 examples, Cebu market. September 30, 1909. Length, 102 to 109 mm.

17257. Pandanon Island. March 24, 1909. 2 examples. Length, 99 to 105 mm. [1441]. Central body stripe a continuation of stripe through top of eye, running downward to center of caudal base; small black spot above at base of caudal; lower stripe of head curves above base of pectoral and ends at margin of axillary region; stripe under pectoral continues to centre of body; between these, in front of base of pectoral, interspace red, continuing across opercle to preopercle margin. Dorsal hyaline of olive. Caudal similar to body, but paler. Lower fins and pectorals hyaline, latter orange at base in axil, more reddish without.

1 example, Pandanon Island. May 24, 1909. Length, 104 mm.

19489. Port Matalvi, Luzon. November 23, 1908. Length, 101 mm.

20867. Tumindao Island. February 25, 1908. Length, 100 mm.

10867 and 10869. Varadero Bay, Mindoro. July 23, 1908. 4 examples. Length, 73 to 97 mm.

22379. Amboina market, Amboina, Dutch East Indies. December 7, 1909. Length, 119 m.

STETHOJULIS TRILINEATA (Schneider)

Labrus trilineatus Schneider, Syst. Ichth. Bloch., 1801, p. 253. Coringo, Coromandel. (On Seba and Koelreuter.)

Stethojulis trilineata Bleeker, Atlas Ichth. Ind. Néerl., vol., 1, 1862, p. 131, pl. 43, fig. 3 (Java, Bawean, Bali, Sumatra, Nias, Celebes, Sangi, Batjan, Amboina, Haruko, Goram, Letti).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 140 (Amboyna); Cruise of Curacoa Brenchley, 1873, p. 411 (Misol, Moluccas).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397

(Amboina River).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 255 (Pelew Islands).—Macleay, Proc. Linn. Soc. New South Wales, vol. 8, 1883, p. 272 (Millport Harbor, New Guinea).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 368 (Timor).

Julis sebanus Valenciennes Hist. Nat. Poiss., vol. 13, 1839, p. 474 (on Seba, Thes., 3, 17, p. 95, no. 5, pl. 31, fig. 5).

Depth 2⅘ to 3; head 2⅚ to 3, width 2$\frac{1}{10}$ to 2⅕. Snout 2¼ to 2⅓; eye 5⅔ to 6⅛, 1⅞ to 2 in snout, 1¼ to 1½ in interorbital; maxillary reaches ¾ to ⅚ to eye, 3⅗ to 4¾ in head; interorbital 4⅕ to 4⅓, broadly convex. Gill rakers 8+18, short tubercles.

Scales in lateral line 20 or 21, 4 or 5+2; 3 scales above lateral line, 9 below, 7 to 9 predorsal. Scales with 15 to 17 basal radiating striae, apical 13 to 15; circuli fine.

D. IX, 11, 1, ninth spine 3½ to 4 in head, first ray 2⅗ to 2⅔; A. II, 11, 1, second spine 4⅕ to 4⅔, first ray 3$\frac{1}{10}$ to 3⅛; caudal 1⅔ to 1⅘, convex behind; least depth of caudal peduncle 2½ to 2⅔; pectoral 1½ to 1⅗; ventral 2 to 2⅕.

Olive gray to glaucous blue above, olive buff below. White narrow band from each side of occiput on back along bases of dorsals. Another from above each side of snout tip to eye, then across horizontally to bases of upper median caudal rays. Third whitish line from below snout tip horizontally above pectoral origin until about opposite middle of depressed pectoral fin. Fourth whitish line from lower lip and end of maxillary, parallel, falling just below pectoral base and ending at lower median caudal rays. Each band with dark bordering lines. Dorsals pale, with median grayish longitudinal line. Fins otherwise all pale brownish.

East Indies. The lines on the side of the body variable and may even be variably broken on one side or the other or both sides. According to Günther *Stethojulis casturi* differs in having but 2 longitudinal lines on the body.

16812. Butaunanan Island. June 12, 1909. 2 examples. Length, 130 to 138 mm.
5105. Cebu market. April 5, 1908. Length, 128 mm.
15322 to 15326. Cebu market. March 19, 1909. Length, 113 to 127 mm. 9 examples.
[1053.] Taganak Island. January 7, 1909. Length, 111 mm.
18488. Tana Keke Island, Celebes. December 21, 1909. Length, 123 mm.

Genus HEMIGYMNUS Günther

Hemigymnus Günther, Ann. Mag. Nat. Hist. London, vol. 8, 1861, p. 386. Type *Mullus fasciatus* Thunberg, monotypic.

Cheilolabrus Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1877, p. 345. Type *Cheilolabrus magnilabris* Alleyne and Macleay, orthotypic.

Body compressed, oblong. Lips thick, pendant. Teeth uniserial. Canines ⅔ anteriorly; posteriorly 1 each side. Preopercle entire.

Scales rather large, 30 in lateral line. Cheek with stripe of very small scales. Opercles naked. Lateral line complete. Dorsal spines 7, rays 11. Anal spines 3, rays 11.

East Indies.

ANALYSIS OF THE SPECIES

a^1. Body with 4 or 5 narrow white transverse bands.....fasciatus.

a^2. Body with 1 pale band transversely in front of spinous dorsal in young, obsolete and body more or less uniform greenish with age...melapterus.

HEMIGYMNUS FASCIATUS (Bloch)

Labrus fasciatus Bloch, Naturg. Ausl. Fische, vol. 6, 1792, p. 6, pl. 290. Japan.—Forster, Faun. Indica, 1795, p. 15.

Mullus fasciatus (not Shaw 1790) (Lamarck) Thunberg, Voy. Japan, vol. 4, 1796, p. 351, pl. 314 ("Meaco," doubtless Miyakoshima, Riu Kiu).

Tautoga fasciata Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 303, pl. 379 (Mauritius).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.

Hemigymnus fasciatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 141, pl. 44, fig. 2 (Java, Nias, Biliton, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 138 (Amboina); Fishes of Zanzibar, 1866, p. 92 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 547 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 396; Fauna British India, vol. 2, 1889, p. 402.—Picaglia, Atti Soc. Nat. Modena, ser. 2, vol. 12, 1893, p. 33 (Assab).

Labrus fuliginosus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 437, 493, pl. 22, fig. 3. Madagascar, Mauritius, Reunion.

Hemigymnus fuliginosus Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 506 (Okinawa).

Sparus zonephorus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 51, 155 (on Bloch, pl. 290).

Sparus meaco Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 54, 160 (on Thunberg).

Labrus malapteronotus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 450, 518, pl. 31, fig. 1. Great Equatorial Ocean.

Scarus quinquefasciatus Bennett, Fishes of Ceylon, 1830, pl. 23. Ceylon.

Halichoeres sexfasciatus Rüppell, Neue Wirbel., Fische, 1835, p. 18, pl. 5, fig. 3. Djedda.

Hemigymnus sexfasciatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 139 (Red Sea).

Tautoga mertensii Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 308. Carolines.

Cheilinus blochii Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 108 (on Bloch, pl. 290).

Tautoga leucomos Bleeker, Nat. Tijds. Ned. Indie, vol. 15, 1858, p. 239. Western Biliton.

Hemigymnus leucomos Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 142, pl. 44, fig. 3 (Biliton).

Depth 2⅖ to 2½; head 2½ to 2⅔, width 2⅕ to 2⅓. Snout 2$\frac{1}{10}$ to 2¼; eye 6 to 7, 2⅔ to 3½ in snout, 1½ to 1⅔ in interorbital; maxillary reaches ½ to ⅔ to eye, 3¼ to 3⅔ in head; lips broad, wide as eye; interorbital 4⅕ to 4¼, moderately convex; opercle with weak radiating striae. Gill rakers 7+16, lanceolate, short.

Scales in lateral line 21 or 22, 5+2; 5 scales above lateral line, 11 below, 15 predorsal. Scales with 8 to 12 basal radiating striae; marginal apical radiating striae 18 to 22; circuli very fine.

D. IX, 11, 1, ninth spine 3 1/10 to 3 1/3 in head, first ray 2 3/5 to 2 7/8; A. III, 11, 1, third spine 3 1/4 to 4, first ray 2 1/2 to 2 3/4; caudal 1 2/5 to 1 3/5, truncate, rounded convexly behind when expanded; least depth of caudal peduncle 1 7/8 to 2 1/10; pectoral 1 3/5 to 1 3/4; ventral 1 3/4 to 2.

Body with 4 broad blackish brown transverse bands, narrowing little below, and last half of caudal peduncle and all of caudal same; interspaces pale to whitish. Head pale brown, with 4 or 5 slightly oblique irregular gray bands, 2 from eye passing forward over front of snout. Pectoral base black, fin pale buff. Other fins all more or less dusky to blackish. Young show blue spot at last scale of upper section of lateral line, 1 at caudal base on lower section and another at end of last tube on caudal.

Red Sea, East Africa, Mauritius, India, East Indies, Micronesia. Variation is noticed in that the last and penultimate white band may be absent sometimes. Also some examples have other scales blue, appearing as spots and scattered variously on tail. Pale bluish or gray spots on predorsal and front of back not always evident as in Bleeker's figure of *Hemigymnus fasciatus*.

5681. Agojo Point, Catanduanes Island. June 10, 1909. Length, 155 mm.

22108. Alimango Bay, Burias Island. March 5, 1909. Length, 150 mm.

16360 and 23732. Biri Channel, Balicuatro Islands. June 1–2, 1909. Length, 105 to 153 mm. [1575.] Head yellowish green above, whitish below; bronzy stripe across nose from below eyes; dash of same in front of each eye and spot behind; another spot on opercle and blotch across lower cheek and backward to opercle; body black, fading to bronzy; breast silver white, behind pectoral four silver white bars from belly; first across middle of abdomen about 1 1/2 diameters of eye, running to point below base of dorsal above; second narrower, running upward from front of anal fin; third from near middle of anal fin and fourth behind axil of anal and dorsal extending around peduncle; these about half diameter of pupil. Dorsal ochraceous, tips of spines and margin of soft fin black; body of fin crossed obliquely by narrow slaty bars, these broken into spots on spinous portion. Caudal dusky ochraceous, a few blackish spots at base and on peduncle. Anal nearly black, fading to somewhat ochry, margin black, slaty purple bar through middle of outer half. Ventrals black. Pectorals dusky hyaline.

5355 and 5356. Bumbum Island. September 25, 1909. Length, 160 to 173 mm,

16810. Butaunanan Island. June 12, 1909. Length, 175 mm.

11060 and 11061. Butaunanan Island. June 13, 1909. Length, 162 to 177 mm.

5676. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 210 mm. [1779.] Lips pale, hinder portion of upper becoming greenish yellow; top of head dusky emerald, side lighter, bars across being dusky vinaceous, margined with blue; black of back and body fades to reddish umber exposing blue spots at bases of scales along back. Dorsal tawny after black disappeared, margin blue, base similar; row of blue spots through center of soft portion extending into last two spinous membranes. Tip of peduncle and caudal fin fading from blackish to tawny ocher, rays olive green. Anal black, margined with blue and broken blue bar within separated by bar of

sepia. Ventrals dusky bottle green. Pectorals dusky orange, membranes hyaline, only base black.

11847. Caracaran, Batan Island. June 8, 1909. Length, 158 mm.
11648. Casogoran, Malhon Island. July 27, 1909. Length, 170 mm.
5398. Cebu market. April 7, 1908. Length, 175 mm.
18804. Cebu market. August 21, 1909. Length, 135 mm. [1878.]
19785. Gomoro Island. December 9, 1909. Length, 160 mm.
16603. Maricaban Island, Luzon. January 20, 1908. Length, 153 mm.
9334. Matnog Bay. May 31, 1909. Length, 150 mm.
9189, 9234. Opol, Mindanao. August 4, 1909. Length, 190 to 220 mm.
5919. Parang, Mindanao. May 23, 1908. Length, 170 mm.
1 example, Philippines. Length, 197 mm.
6388, 9279. Port Jamelo, Luzon. July 13, 1908. Length, 190 to 213 mm.
7052. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 190 mm.
18970. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 152 mm.
21299. Tidore Island, south of Ternate. November 24, 1909. Length, 160 mm.
52443 U.S.N.M. Apia. Bureau of Fisheries. Length, 200 mm. 1 example.
71640 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 220 mm. 1 example.
71641 U.S.N.M. Nafa. *Albatross* collection. Length, 213 mm. 1 example.

HEMIGYMNUS MELAPTERUS (Bloch)

Labrus melapterus Bloch, Naturg. Ausl. Fisch., vol. 5, 1791, p. 137, pl. 285. Japan.

Tautoga melapterus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 311 (Java).

Hemigymnus melapterus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 142, pl. 45, figs. 2–3 (Java, Duizend Islands, Cocos, Sumatra, Batu, Nias, Singapore, Bintang, Celebes, Amboina, Ceram, Goram).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Day, Fishes of India, pt. 3, 1877, p. 396, pl. 84, fig. 2.—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 367 (Saleyer, Banda).—McCulloch, Proc. Linn. Soc. New South Wales, vol. 40, pt. 2, 1915, p. 265 (types of *Cheilolabrus magnibabris*, Port Moresby, New Guinea).

Hemigymnus melanopterus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 139 (Celebes, Java, Port Essington, Endeavor Reef, Australia).—Kner, Reise Novara, Fische, vol. 2, 1865, p. 252 (Singapore). Gunther, Fishes of Zanzibar, 1866, p. 92 (Zanzibar).—Klunzinger, Sitzs. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 404 (Port Darwin).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 253 (East Africa, North Australia, Pelew Islands, Samoa).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Rubi, New Guinea).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).—Steindachner, Abhandl. Senckenberg. Ges., vol. 25, 1900, p. 441 (Batjan).

Cheilinus macrocheilus (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 311. Java (name in text).

Tautoga dimidiata Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 18. No locality.

Julis beraber Thiollière, Faun. Woodlark, 1857, p. 196. Woodlark Island.

Labrus scapularis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 142 (name in synonymy).

Labrichtys bicolor Day, Proc. Zool. Soc. London, 1870, p. 696. Andaman Islands.

Cheilolabrus magnilabris Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, 1877, p. 345, pl. 16, fig. 2. Darnley Island.

Depth 2⅖ to 2⅔; head 2¼ to 2¾, width 2⅕ to 2⅖. Snout 1¾ to 2⅕; eye 4¼ to 9, 2⅕ to 6 in snout, 1 to 2 in interorbital; maxillary reaches ½ to ⅗ to eye, 3⅕ to 4 in head; lips nearly or quite broad as eye-diameter, equal 1½ eye-diameters in large examples; interorbital 3¾ to 4½ in head, convex; opercle weakly, though finely with radiating striae. Gill rakers 8+19, lanceolate, short.

Scales in lateral line 20 or 21, 5+2; 6 scales above lateral line, 11 below, 14 predorsal. Scales with 10 or 11 basal radiating striae; apical and marginal radiating striae 30 to 41; circuli very fine.

D. IX, 10, 1 or 11, 1, ninth spine 3 to 4 in head, first ray 2⅗ to 3⅕; A. III, 10, 1, third spine 3 to 4⅓, first ray 3 to 3$\frac{1}{10}$; caudal 1⅖ to 1½, truncate; least depth of caudal peduncle 2⅓ to 2⅔; pectoral 1⅗ to 1⅔; ventral 1⅘ to 1$^5/_6$.

Head and front of trunk rather pale brown. Posterior half of trunk, tail and caudal all deeper olive brown. Each scale on body with dark margin and vertical grayish line. Head variegated with vermiculate grayish or heliotrope vermiculating line on upper part of snout, below eyes and down on opercles and preopercle. Large neutral gray blotch close behind eye, through which vermiculations show, in size at least twice eye. Vertical fins all more or less neutral gray blue. Dull bluish submarginal lines on dorsals and anals and blue spots on caudal submarginally. Paired fins pale brown.

Zanzibar, Mauritius, India, East Indies, Queensland, Japan, Samoa.

5689. Agojo Point, Catanduanes Island. June 10, 1909. Length, 200 mm.
13730 and 16068. Alimango Bay, Burias Island. March 5, 1909. Length, 208 to 215 mm.
13500. Alimango Bay. December 9, 1909. Length, 158 mm.
8342 and 8344. Buang Bay, Talajit Island. March 15, 1909. Length, 300 to 358 mm.
10681 and 10682. Bubuan Island. February 14, 1908. Length, 130 to 187 mm.
15572. Bugsuk Island, Balabac. January 5, 1909. Length, 109 mm.
8368. Busin Harbor, Burias Island. April 22, 1908. Length, 200 mm.
8800. Butaunanan Island. June 13, 1909. Length, 363 mm.
7850 to 7852. Candaraman Island, Balabac. January 4, 1909. Length, 152 to 175 mm.
5621. Caxisigan Island, off Balabac. January 2, 1909. Length, 140 mm.
5344. Cebu market. April 4, 1908. Length, 223 mm.
6526. Cebu market. April 5, 1908. Length, 203 mm.
14459. Cuyo Island, Cuyo. April 9, 1909. Length, 94 mm.
8142. Dasol Bay. May 9, 1909. Length, 158 mm.
7481. Endeavor Strait. December 22, 1908. Length, 320 mm.
5125. Endeavor Strait. December 23, 1908. Length, 207 mm.
4875. Galera Bay, Mindoro. June 9, 1908. Length, 253 mm.
7182. Ganda Island. September 20, 1909. Length, 318 mm.
14425. Gubat Bay, Luzon. June 23, 1909. Length, 150 mm.
13203. Jolo Island, Jolo. Length, 155 mm.
7739. Jolo market, Jolo. February 12, 1908. Length, 178 mm.

5980 and 9824. Little Santa Cruz Island. May 26, 1908. Length, 190 to 240 mm.
8304, 16967, 16968. Lode Bay, Destacado Island. March 13, 1909. Length, 152 to 323 mm.
7882, 7883, 14562. Maculabo Island. June 14, 1909. Length, 123 to 200 mm.
15796. Makesi Island, Palawan. April 5, 1909. Length, 185 mm.
6284. Malapascua Island. March 16, 1909. Length, 220 to 225 mm.
9075, 9087. Malhon Island. July 27, 1909. Length, 250 to 255 mm.
6181, 6199, 15917. Mansalay, Mindoro. June 4, 1908. Length, 225 to 290 mm.
5445. Mantacao Island, Bohol. April 8, 1908. Length, 250 mm.
6589. Maricaban Island near Sepoc Point. July 21, 1908. Length, 253 mm.
5558. Masbate Reef, Masbate. April 20, 1908. Length, 224 mm.
7236 and 7237. Masinloc Bay, Zambales. November 22, 1908. Length, 240 to 260 mm.
19022. Northwest Verde Island. July 22, 1908. Length, 140 mm.
15657. Pagapas Bay, Luzon. February 20, 1909. Length, 220 mm.
15918. Pangasinan Island. February 13, 1908. Length, 167 mm.
4852. Panpan, Tara Island. September 20, 1909. Length, 262 mm.
8193. Port Busin, Burias Island. March 8, 1908. Length, 234 mm.
7762. Port Ciego, Balabac Island. Length, 303 mm.
6370. Port Jamelo. July 13, 1908. Length, 345 mm.
6544. Port Maricaban. July 21, 1908. Length, 343 mm.
7035. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 300 mm.
21004. Pujada Bay, Mindanao. May 15, 1908. Length, 130 mm.
21351. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 146 mm.
12597 to 22219. Rapu Rapu Island. June 22. 1909. Length, 130 to 205 mm.
18922. Romblon. March 25, 1908. Length, 125 mm.
5276. Romblon Harbor. March 25, 1908. Length, 325 mm.
15713 and 15714. Sanguisiapo Island. February 24, 1908. Length, 128 to 150 mm.
8700. San Miguel Island. June 4, 1909. Length, 370 mm.
18161, 18162, 22065. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 103 to 149 mm.
4996. Simonor Island. February 24, 1908. Length, 233 mm.
17663. Sitanki Reef. September 24, 1909. Length, 144 mm.
5128, 5719, 5720. Surigao, Mindanao. May 8, 1908. Length, 183 to 285 mm.
5021. Tacloban market. July 25, 1909. 2 examples. Length, 100 to 195 mm.
12492. Tara Island. December 14, 1908. Length, 185 mm.
6835. Tataan, Simaluc Island. February 19, 1908. Length, 150 mm.
5812. Tataiboda Point, Pujada Bay, Mindanao. May 15, 1908. Length, 285 mm.
10889. Tilig, Lubang. July 15, 1908. Length, 208 mm.
15579 and 21726. Tulayan Island. September 15, 1909. Length, 89 to 103 mm.
13155, 13157, 13158. Tumindao Island. February 26, 1908. Length, 05 to 166 mm.
10992. Ulugan Bay, Channel. December 28, 1908. Length, 147 mm.
7710. Ulugan Bay, Oyster Inlet. December 29, 1908. Length, 270 mm.
5133. Usada Island, near Jolo. March 5, 1908. Length, 248 mm.
7411. Uson, west of Pinas Island. December 17, 1908. Length, 238 mm.
6658. Varadero Bay, Mindoro. July 22, 1908. Length. 303 mm.
A1478. Kait Point, Libani Bay, Celebes, Dutch East Indies. December 29, 1909. Length, 246 mm.
4801. Limbe Strait, Celebes. November 10. 1909. Length, 257 mm.
6849. Hong Kong, China. October 22, 1908. Length, 235 mm.
13859. Apra Bay, Guam. November 19–21, 1907. Length, 160 mm.

52486 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 215 to 320 mm. 7 examples.
9591 A.N.S.P. Samoa. Dr. H. C. Caldwell. Length, 41 mm.
9653 A.N.S.P. Samoa. Dr. H. C. Caldwell. Length, 212 mm.
31036 to 31037 A.N.S.P. Apia. Bureau of Fisheries. Length, 223 to 250 mm.

Genus HALICHOERES Rüppell

Halichoeres Rüppell, Neue Wirbelth., Fische, 1835, p. 10 (14). Type *Halichoeres bimaculatus* Rüppell, designated by Jordan and Evermann, Genera of Fishes, vol. 1, 1917, p. 184. (Not *Halichoerus* Nilsson, 1820 in mammals.)

Halychoeres Bonaparte, Fauna Italica, Pesc., vol. 1, 1841, fasc. xxx. Type *Halichoeres bimaculatus* Rüppell.

Platiglossus Klein, Neuer Schauplatz, vol. 3, 1776, p. 300. Type *Platiglossus squamulis laevibus* Klein=*Julis annularis* Valenciennes, designated by Bleeker, Proc. Zool. Soc. London, December 10, 1861, p. 411.

Platyglossus Bleeker, Proc. Zool. Soc. London, December 10, 1861, p. 411. Type *Julis annularis* Valenciennes.

Hemiulus Swainson, Nat. Hist. An., vol. 2, 1839, p. (173) 228. Type *Labrus guttatus* Bloch, designated by Bonaparte, Fauna Italica, Pesc., vol. 1, 1841, fasc. xxx.

Icthycallus Swainson, Nat. Hist. An., vol. 2, 1839, p. (173) 232. Type *Julis semipunctatus* Rüppell, designated by Swain, Proc. Acad. Nat. Sci. Phila., 1882, p. 275.

Ichtycollus Bonaparte, Fauna Italica, Pesc., vol. 1, 1841, fasc. xxx. Type *Julis semipunctatus* Rüppell.

Güntheria Bleeker, Proc. Zool. Soc. London, December 10, 1861, p. 413. Type *Halichoeres coeruleovittatus* Rüppell, orthotypic.

Hemitautoga Bleeker,[19] Proc. Zool. Soc., London, December 10, 1841, p. 413. Type *Labrus centriquadrus* (Commerson) Lacépède, orthotypic.

Chaerojulis Gill, Proc. Acad. Nat. Sci. Phila., 1862, p. 192. Type *Julis semicinctus* Ayres, monotypic.

Parajulis Bleeker, Ned. Tijdsk. Dierk., vol. 2, 1865, p. 251. Type *Julis poecilopterus* Schlegel, orthotypic.

Iridio Jordan and Evermann, Rep. U. S. Fish Comm., 1895 (1896), p. 412. Type *Labrus radiatus* Linnaeus, designated by Jordan, Genera of Fishes, vol. 4, 1920, p. 473.

Octocynodon Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535. Type *Julis miniatus* Valenciennes, orthotypic.

Body oblong, compressed. Head compressed, conic. Teeth large; anterior canines $\frac{2}{2}$ to $\frac{4}{4}$; usually 1 each side behind. Preopercle entire. Gill rakers short, weak. Gill membranes slightly joined to narrow isthmus. Scales large, 25 to 30 in lateral line. Head usually naked, sometimes few small scales on cheek behind eyes. Dorsals with or without distinct basal scaly sheath. Lateral line not interrupted, abruptly bent behind. Fins low, dorsal spines 9, rays 11. Anal spines 3, rays 11. Caudal lunate, truncate or rounded. Ventrals inserted below pectoral base.

Small brilliant fishes of tropical seas, remarkable for their greatly variable color-patterns.

[19] Jordan quotes *Hemitautoga* twice on the same page, Genera of Fishes, vol. 3, 1919, p. 309, first as a synonym of *Coris* Lacépède and then as a synonym of *Güntheria* Bleeker.

We give a number of illustrations of the species suitable to show the variation of color-pattern on the head. Unfortunately in a number of cases these designs have faded from the specimens, so that we could not prepare more complete series of figures. In few, if any cases, have we found the designs exactly alike on both sides of the head.

ANALYSIS OF THE SPECIES

a^1. Head somewhat scaly; size moderate or large.

b^1. HEMITAUTOGA. Opercle above and postocular scaly; pale blotch below front dorsal spines; each body scale with dark vertical blotch; cheek with several red bands below ..... **centriquadrus.**

b^2. GÜNTHERIA. Opercle above somewhat scaly, postocular naked; no pale blotch below front dorsal spines; cheek with few or no red blotches or bands below.

c^1. Blackish or blue band from head to caudal, along lower side of back; no black blotches above lateral line ..... **scapularis.**

c^2. No black or blue lateral band; 2 black blotches above lateral line, of which second on caudal peduncle above ..... **trimaculatus.**

a^2. Head entirely scaleless, size moderate or small.

d^1. PLATYGLOSSUS. Dorsal and anal bases usually with low basal scaly sheaths; muzzle rather attenuated; size moderate.

e^1. Dorsals without black ocellus.

f^1. Dorsals and anals with oblique or longitudinal dark or red lines.

g^1. Dorsal and anal dark lines oblique; caudal violet, with transverse bands; dorsal and anal rays 13 or 14 ..... **leucurus.**

g^2. Dorsal and anal dark lines longitudinal; dorsal and anal rays 12 or 13.

h^1. Pectoral base not entirely covered with dark or blackish blotch.

i^1. Small black spot at pectoral origin; no pale postocular band or pale opercular blotch.

j^1. Caudal violet, with transverse rose-violet band; dorsal violet, with many rose-violet lines; back without pale blotches. **kallochroma.**

j^2. Caudal rose, with transverse black band at hind border; dorsal rosy, with 2 longitudinal bands, upper red, lower violet; back with 7 transverse yellow blotches ..... **melanurus.**

i^2. No black spot at pectoral origin; pale or whitish postocular band and opercular blotch ..... **richmondi.**

h^2. Pectoral base entirely covered with large blackish blotch. **melanochir.**

f^2. Dorsals ocellated.

k^1. Dorsal ocelli small and very numerous; caudal with large transverse purple band; pectoral base violet; back without large yellow blotches ..... **marginatus.**

k^2. Dorsal ocelli large, less numerous; caudal without transverse band, but covered with red ocelli; pectoral base yellow; back with 3 large yellow blotches ..... **vrolickii.**

e^2. Dorsals with large black ocellus between first divided rays.

l^1. Body and fins brown; dorsal with reddish ocelli; pectoral base without violet spot; black dorsal ocellus large. **notopsis.**

l^2. Body blue; fins rosy; dorsal and anal with longitudinal bands, but without red ocelli; black dorsal ocellus small. **hoevenii.**

d^2. HALICHOERES. Dorsal and anal bases without basal scaly sheaths; muzzle less attenuate; size small.

m^1. Upper front canines 4; black spot between front dorsal rays.

n^1. Dorsal with oblique violet streaks.

o^1. Lower lateral or abdominal scales lunated with shining yellow; anal with black dots ..... **miniatus.**

o^2. Lower lateral or abdominal scales with oblique shining yellow streaks; anal with oblique rosy lines. **margaritaceus.**

n^2. Dorsal with ocelli; anal with ocelli and crimson longitudinal band.

p^1. Cheek with rose-violet band as ring or arc; pectoral base without violet blotch ..... **nebulosus.**

p^2. Cheek with arched rose-violet band, never circular.

q^1. Dusky blotch before pectoral base ..... **reichei.**

q^2. Pectoral base with large neutral dusky blotch, extends upon lower humeral region ..... **desmogenys.**

m^2. Two canines in front of each jaw.

r^1. Front dorsal spines somewhat diverge; spinous dorsal with black blotch.

s^1. Black spot at fifth and sixth dorsal rays and at caudal base; black blotch between front dorsal spines. **solorensis.**

s^2. No black spot on soft dorsal.

t^1. Black blotch on spinous dorsal between fourth to seventh spines; caudal with transverse rose-violet bands, black at hind border ..... **papilionaceus.**

t^2. Black blotch on spinous dorsal between fifth to eighth spines.

u^1. Large transverse irregular dark blotches on back; pectoral base with triangular violet blotch. **nigrescens.**

u^2. Violet band from opercle to caudal, studded with white ocelli; pectoral base uniformly pale. **bicolor.**

r^2. Front dorsal spines not divergent.

v^1. Black blotch at front of soft dorsal.

w^1. Caudal base with black ocellus.

x^1. Body with rosy longitudinal streaks or lines crossing dark transverse bands; 4 or 5 dark postocular lines ..... **leparensis**

x^2. No longitudinal rosy body lines; 2 dark postocular bands ..... **binotopsis.**

v^2. Black or blue blotch between anterior dorsal spines only.

y^1. Head banded.

z^1. Two dark longitudinal bands on body from snout to caudal base.

a^3. Caudal base with black ocellus; dorsal rays 17 ..... **hyrtlii.**

a^4. No caudal ocelli; dorsal rays 11 ..... **poecilopterus.**

z^2. No longitudinal dark bands on body; only rose-violet bands on head.

b^3. Soft dorsal and anal with oblique red lines; narrow blackish triangular blotch at pectoral base ..... **amboinensis.**

b^4. Soft dorsal and anal with several longitudinal darker bands; small black basal pectoral spot size of pupil.....tenuispinis.

y^2. Head violet, without bands; dorsals and anals with longitudinal blue lines.....prosopeion.

y^3. Dorsal without black blotches; head with bands or spots.

c^3. Body with ocelli and bands.

d^3. Body with broad longitudinal rosy band edged purple and blue; dorsal and anal with longitudinal blue and violet bands.....hartzfeldii.

d^4. Trunk, not tail, covered with red spots, ocellated with blue; yellow and black spots along back.....argus.

d^5. Front part of trunk rosy-violet, covered with green spots ocellated with blue; hind part of trunk clear green, without ocelli. chloropterus.

c^4. Body without ocelli or longitudinal bands.

e^3. No white blotches along median axis of tail.

f^3. Dorsal with oblique orange bands; large dark blotch on flanks; back and tail with minute black dots.....gymnocephalus.

f^4. Dorsal and anal with oblique black streaks; head and tail rosy-orange; middle of trunk violet, with oblong black spots.....podostigma.

e^4. Four white spots along median axis of tail.....leucostigma.

HALICHOERES CENTRIQUADRUS (Lacépède)

Labrus centriquadrus (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, 1802 pp. 437, 493. Madagascar, Mauritius, Reunion.

Hemitautoga centriquadrus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 139, pl. 32, fig. 3 (Java, Sumatra, Borneo, Celebes, Sangi, Flores, Timor, Letti, Amboina, Goram).—Bleeker, Ned. Tijds. Dierk., vol. 4, 1874, p. 117 (China).

Platyglossus (*Hemitautoga*) *centriquadrus* Bleeker, Verh. Akad. Wet. Amsterdam, vol. 18, No. 3, 1879, p. 1 (Mauritius).

Halichoeres centriquadrus Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 300, pl. 46, fig. 3 (Pago Pago and Apia).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Cagayancillo).

Labrus hortulanus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 449, 518, pl. 29, fig. 2. Great Equatorial Ocean (Indo-Pacific).

Julis hortulanus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 430 (Mauritius).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.

Platyglossus hortulanus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 147 (Red Sea, Mauritius, Ceylon, Moluccas, Amboina, Celebes, East Indies, Aneiteum); Fishes of Zanzibar, 1866, p. 94 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 546 (Koseir, Red Sea).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Day, Fishes of India, pt. 3, 1877, p. 399, pl. 85, fig. 3 (Andamans).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (North Celebes).—Day, Faun. British India, vol. 2, 1889, p. 406, fig. 139.—Picaglia, Atti Soc. Nat. Modena, ser. 2, vol. 12, 1893, p. 33 (Aden).—Steindachner, Abhañdl. Senckenberg. Ges., vol. 25, 1900, p. 442 (Ternate).—Günther, Journ. Mus. Godeffroy, vol. 8, 1909, p. 263 (East Africa, Society Islands, Samoa, Aneiteum, Shortland, Mortlock, Ponape, Guam, Rotuma).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 375 (Karakelang Island, Beo, Salibabu, Banda).

Sparus decussatus Bennett, Fishes of Ceylon, 1834, pl. 14. Ceylon.

Halichoeres eximius Rüppell, Neue Wirbelth., Fische, 1835, p. 16, pl. 5, fig. 1. South half of Red Sea.

Depth 2⅗ to 2⅘; head 2⅘, width 2⅕ to 2¼. Snout 2½ to 2⅞; eye 7, 2⅘ to 2⅞ in snout, 1¾ to 1⅘ in interorbital; maxillary reaches ¾ to eye, 3⅕ to 3⅓ in head; interorbital 4⅖ to 4½, convex. Gill rakers 13+13, lanceolate, short, robust.

Scales in lateral line 20, 5+2; 4 scales above lateral line, 9 below, 10 predorsal. Scales with 26 to 33 basal parallel striae and 2 to 5 marginals; imperfect parallel apical striae 26 to 35; circuli very fine.

D. IX, 10, 1 or 11, 1, ninth spine 3½ to 5⅙ in head, tenth ray 2⅔ to 2¾; A. III, 11, 1, third spine 5 to 5⅓, tenth ray 2⅗ to 3; caudal 1⅓ to 1⅔, truncate, hind edge slightly convex; least depth of caudal peduncle 1⅞; pectoral 1⅓ to 1⅜; ventral 1⅔ to 1½.

Brown generally, pale to whitish below. Pale or whitish spot below front dorsal spines on edge of back and another at front of soft dorsal. Each scale on back with vertical neutral slaty bar. Predorsal with round whitish spot on each scale. On side of head 5 oblique grayish or whitish bands. Fins all pale brownish, with round gray spots on soft dorsal and pale longitudinal submarginal band. Caudal with about 6 neutral dusky transverse lines. Paired fins pale brown, small dusky spot at caudal base above.

Red Sea, East Africa, Mauritius, India, East Indies, Samoa. The largest species of the genus and handsomely colored.

7688. Agojo Point, Catanduanes Island. June 10, 1909. Length, 186 mm.
6522. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 220 mm.
12000. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 225 mm.
10834. Dalaganem Island. April 8, 1909. Length, 132 mm.
7185. Ganda Island. September 20, 1909. Length, 183 mm.
11669. Jolo market. February 11, 1908. Length, 173 mm.
53271. Jolo reefs. March 6, 1908. Length, 255 mm.
13345. Langao Point, Luzon. June 24, 1909. Length, 148 mm.
11356. Maagnas, Lagonoy Gulf, Luzon. June 17, 1909. Length, 223 mm.
9335. Matnog Bay. May 31, 1909. Length, 137 mm.
10812. Murcielagos Bay, Mindanao. August 20, 1909. Length, 203 mm.
12460. Pagapas Bay, Luzon. February 20, 1909. Length, 197 mm.
6185. Palag Bay vicinity, Luzon. June 16, 1909. Length, 200 mm.
12870 and 13110. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 179 to 198 mm.
1 example, Pilas Island. September 12, 1909. Length, 148 mm.
17621. Port Langcan, Palawan Island. April 8, 1909. Length, 212 mm. [1504.] Head olive green above and on opercles, bright green on cheek, very pale lemon below. Stripes dull salmon red, washed with blue above and on opercle and become pale salmon below. Pectoral axil pale sulphur, blotch of geranium on inner base of fin and line of same above, showing through hyaline fin. Pale peach spots on scales below and behind pectoral base. Back and upper side dull olive, to white or gray below, scale bases violet black. Tip of caudal peduncle washed with yellow, scale bases becoming dusky orange. Body and spots of dorsal sulphur, reticulations and bars orange, limited in middle and bases of fins by dark lines; spinous tips blackish, also first spine, lines, bars, and reticulations dark basally. Caudal bright yellow, and irregularly mixed orange and brown. Anal very pale sulphur, bars pale gray, 2 straight on terminal half; series of arches above base. Ventral hyaline. Pectoral rays slightly darker.

7655. San Roque, Leyte. July 29, 1909. Length, 208 mm.
5780 and 5781, 9451, 16960. Simaluc Island. September 22, 1909. Length, 148 to 183 mm.
20527. Sipadan Island. September 28, 1909. Length, 96 mm.
1 example, Sitanki reef. September 24, 1909. Length, 75 mm.
A. 552. Sulade Island. September 17, 1909. Length, 233 mm.
9375. Taganak Island. January 7, 1909. Length, 142 mm. [1052.]
4660, 4661, and 18601. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 154 to 233 mm.
7153 and 7154. Teomabal Island. September 18, 1909. Length, 213 to 250 mm.
9436. Tulayan Island. September 15, 1909. Length, 175 mm.
7687. Ulugan Bay, Palawan Island. December 29, 1908. Length, 145 mm.
13455 to 13458. Limbe Strait, Celebes. November 9, 1909. Length, 180 to 224 mm.
13636. Una Una Road, Binang Unang Island, Celebes. November 18, 1909. Length, 89 mm.
21301. Tidore Island, south of Ternate. November 24, 1909. Length, 133 mm.
52229 U.S.N.M. Apia. Bureau of Fisheries. Length, 73 to 175 mm. 4 examples.

HALICHOERES SCAPULARIS (Bennett)

Julis scapularis Bennett, Proc. Comm. Zool. Soc. London, vol. 1, 1831, p. 167. Mauritius.

Platyglossus scapularis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 146 (type, Mozambique, Ceram, Amboina); Fishes of Zanzibar, 1866, p. 94 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 545 (Koseir, Red Sea).—Günther, Cruise Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Day, Fishes of India, pt. 3, 1877, p. 400, pl. 85, fig. 4 (Andamans).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu, North Celebes, Sangi).—Day, Fauna British India, vol. 2, 1889, p. 408.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 554 (Cebu).—Borsieri, Ann. Mus. Civico Genova, ser. 3, vol. 1, 1904, p. 215 (Massaua, Daalac Archipelago, Nocra, Dissei, Red Sea).—Regan, Ann. Natal Mus., vol. 1, 1908, p. 246 (Kosi Bay).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 263 (Indian Ocean, Red Sea, East Indies, Micronesia).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 131 (Saonek and Ambon).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 372 (Menado, Siau, Saleyer).

Choerojulis scapularis Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina).

Halichoeres scapularis Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 29 (Panay and Manila).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).

Julis ceylonicus Bennett, Proc. Comm. Zool. Soc., vol. 2, 1832, p. 183. Ceylon.

Platyglossus ceylonicus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 158 (copied).

Halichöres caeruleo-vittatus Rüppell, Neue Wirbelth. Fish., 1835, p. 14, pl. 4, fig. 1. Djedda market.

Julis caeruleovittatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 466 (copied).

Guntheria coeruleovittata Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 137, pl. 32, fig. 2 (Java, Bawean, Singapore, Sumatra, Nias, Batu, Celebes, Sangi, Buru, Amboina, Goram, Timor, Flores, Solor).

Julis leschenaulti Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 453, Mauritius.—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.

Julis elegans (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 467. Java.

Julis (*Halichoeres*) *phaiotaenia* Bleeker, Nat. Tijds. Ned. Indie, vol. 8, 1855, p. 322. Batu Archipelago.

Julis cruentatus (Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 136 (name in synonymy).

Platyglossus alternans Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1874, p. 104. Cebu and Panglao.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 553 (Cebu, Panglao).

Platyglossus (*Güntheria*) *pagenstacheri* Kossmann and Räuber, Zool. Ergebn. K. Acad. Wiss, Berlin, vol. 1, 1877, p. 25, pl. 1, fig. 5. Red Sea.

Pseudojulis ziczac De Vis, Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 882. Murray Island, Queensland.

Halichoeres cymatogrammus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 786, fig. 8. Negros, Philippines.

Depth 3⅛ to 3½; head 3 to 3⅛, width 2$\frac{1}{10}$ to 2⅕. Snout 2½ to 2⅞; eye 4¾ to 6, 1⅗ to 2⅕ in snout, 1 to 1½ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3⅞ to 4 in head; interorbital 4 to 5, convex. Gill rakers 8 + 12, lanceolate, short.

Scales in lateral line 20 or 21, 5+1; 3 or 4 scales above lateral line; 9 below, 6 to 8 predorsal. Scales with 39 to 44 basal radiating striae, apical 17 to 29; circuli very fine.

D. IX, 11, 1, ninth spine 3⅓ to 3⅞ in head, first ray 2⅓ to 2¾; A. III, 11, 1, third spine 4¾ to 6⅔, first ray 3⅛ to 3⅕; caudal 1⅗ to 1⅗, little convex behind, more so as expanded; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1½ to 1⅗; ventral 1¼ to 1⅔.

Pale olive brown above, becoming whitish below. Each scale on back and sides above with pale blue median crescentic blotch, variable and in some smaller examples so extensive as to form a well developed longitudinal dark band, when most of other markings fade out. On head broad, cuneate, pale blue blotch on snout, another below eye and variable pale blue blotch, blotches or band behind eye; also variably several pale blue spots or bars on opercle. Iris pale yellowish. Dorsal pale brown, with median longitudinal buff band and soft fin with marginal buff band. Anals transparent with white longitudinal subbasal band and submedian outer line of gray. Caudal pale brown, with about 5 variable, waved vertical whitish lines. Paired fins uniformly pale, with slight inconspicuous pale or whitish spot at pectoral axil.

Red Sea, Zanzibar, Natal, Mauritius, India, East Indies, Queensland, Melanesia, Samoa. Possibly *Pseudojulis murrayensis* De Vis,[20] incompletely described, may be the present species. It is said to have the anal with 4 small bright black spots on each web. Dorsals with fainter spots, more or less confluent on the spinous portion into oblique bands.

[20] Proc. Linn. Soc. New South Wales, vol. 9, 1884, p. 882. Murray Island.

1 example, Batan Island, tide pools. July 23, 1909. Length, 54 mm.
15577. Bugsuk Island, Balabac. January 5, 1909. Length, 86 mm.
12092. Capunuypugan Point, Mindanao. March 10, 1908. Length, 137 mm.
7667, 12667, 12668. Cebu market. April 4, 1908. Length, 153 to 176 mm.
5098 and 5104. Cebu market. April 5, 1908. Length, 45 to 73 mm.
6101, 6102, 7578. Cebu market. April 6, 1908. Length, 132 to 168 mm.
7832 and 7840. Cebu market. April 7, 1908. Length, 103 to 145 mm.
21760. Cebu market. March 20, 1909. Length, 144 mm. [1402.] Green above, paler below; head with vinaceous markings; centers of scales of middle of sides and above darker; lower head yellow, breast and belly paler. Dorsal with broad orange or scarlet stripe along base, this taking form of arches across membranes posteriorly, an inframarginal narrower stripe of same color, extreme tips of soft rays whitish. Caudal yellow, crossed in its basal region by several irregular bars of scarlet or orange. Anal pale, tips more or less hyaline, inframarginal reddish bar and brighter red bar along base. Paired fins pale pinkish.
18680, 18681. Cebu market. March 24, 1909. Length, 165 to 167 mm. [1469.] Bright green, back yellow along dorsal; bright red area on preorbital, another on cheek, and several behind eye on opercle; reds continue backward on scale edges along region of lateral line and obliquely downward behind pectoral base. Dorsal yellow, broad basal geranium bar, another marginal on spinous fin and submarginal on soft fin, also both bars bordered by pale blue. Anal similar, but less distinct. Caudal yellow, with 2 or 3 geranium bars at base. Paired fins plain.
6100. Cebu market. August 12, 1909. Length, 118 mm.
14183 and 14184. Cebu market. September 2, 1909. Length, 95 to 111 mm.
22496 and 22828. Danawan and Si Amil Island. September 27, 1909. Length, 53 to 104 mm. 4 examples.
13 examples, Gubat Bay, Port Gubat, Luzon, June 23, 1909. Length, 80 to 121 mm. [1691]. Pale green; blackish lateral stripe from eye to upper portion of peduncle, occupying full row of and two half rows of scales; top and side of head with reddish stripes, broad bronzy one on preorbital; pink area under eye on upper cheek; pink line across opercle to base of pectoral, behind which runs downward nearly to middle of ventral. Dorsal color of back, two narrow red bars, 1 marginal of spinous fin and submarginal of soft fin, tips of soft portion hyaline. Caudal yellowish, with about four reddish bars. Anal similar to dorsal, but paler. Ventrals hyaline. Pectoral rays dusky, membranes hyaline.
15467. Galera Bay, Mindoro. June 9, 1908. Length, 61 to 110 mm. 4 examples.
13066. Gomomo Island. December 3, 1909. Length 123 mm.
8 examples, Great Tobea Island. December 15, 1909. Length, 32 to 92 mm.
19283. Inamucan Bay, Mindanao. August 9, 1909. Length, 108 mm.
1 example, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 61 mm.
8972. Murcielagos Bay, Mindanao. August 20, 1909. Length, 156 mm.
10001. Murcielagos Bay. August 21. 1909. Length, 152 mm.
1 example, Pandanon Island. May 14, 1909. Length, 64 mm.
15940. Pangasinan Island. February 13, 1909. Length, 143 mm.
13150. Polloc, Mindanao. May 22, 1908. Length, 146 mm. [336.] Middle of back greenish yellow; on nape and anterior region olive green; along either side of lateral line for about 1½ rows of scales each scale blotched with pale reddish purple, these fusing into small geranium pink blotches on peduncular region where a second axial row of two scales below; on shoulder an irregular blotch of orange and green; below sides and lower region silvery, base of each scale with pale narrow green bar; top of head bright emerald

green; preorbital marked with subtriangular chrome blotch, bordered with blue; cheek with chrome and pink blotch passing upward behind eye, covering postorbital and upper part of opercle; this defined indefinitely by narrow blue line; top of head and nape with round dots and blotches of pinkish; opercle indistinctly blotched with lavender red; broken series of stripes passing from gill opening downward around base of pectoral and ventral. Dorsal: proximal half pale geranium pink, bordered above and below by bluish shades, above pale yellow band; tips of spinous portion pink, the color continued as submarginal band on soft portion, with tips hyaline. Caudal tipped with lemon yellow about breadth of eye, remainder of fin with geranium red bars, interspaces lilac with yellowish wash. Anal base geranium pink, bordered below very narrowly by blue; above with broad blue band occupying middle portion of fin; terminal third hyaline, with pink internally. Ventral hyaline, produced tip whitish. Pectoral hyaline. Iris orange red.

2 examples, Sablayan, Mindoro. December 15, 1908. Length, 51 to 62 mm.

4 examples, Simaluc, Bisibisi Island. September 23, 1909. Length, 26 to 58 mm.

22508. Tataan, Simaluc Island, Tawi Tawi. February 20, 1908. 4 examples. Length 60 to 83 mm. [240.] Back and top of head light grayish green, sides and below bluish white; broad and very distinct zig-zag lateral stripe wide as eye from gill slit to caudal base (upper); continued forward as black bar on opercle and dark bar on snout; broad band from snout through eye to gill slit greenish, yellow on snout, lemon yellow on opercle. Iris yellow, continued backward and involving the black lateral band in an obscure yellow green. Dorsal pale greenish yellow. Caudal pink, pale yellow at base, the margin hyaline. Ventrals and pectorals colorless.

14296. Teomabal Island. September 18, 1909. Length, 122 mm.

2 examples, Tobea Island. December 15, 1909. Length, 58 mm.

13151. Tumindao Island. February 26, 1908. Length, 110 mm.

2 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1099. Length, 21 to 41 mm.

1 example, Gane Road, Gillolo Island. December 1, 1909. Length, 118 mm.

56000 U. S. N. M. Bacon. Bureau of Fisheries. Length, 132 mm. 1 example.

HALICHOERES TRIMACULATUS (Quoy and Gaimard)

Julis trimaculata Quoy and Gaimard, Voy. Astrolabe, Zool., vol. 3, 1834, p. 705, pl. 20, fig. 2. Vanikolo.

Güntheria trimaculata Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 138, pl. 32, fig. 1 (Cocos, Celebes, Sangi, Flores, Buru, Amboina, Haruko, Banda, Goram, Letti).

Platyglossus trimaculatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 153 (East Indies); Cruise Curacoa, Brenchley, 1873, p. 410 (Solomons).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).—Günther, Journ. Mus. Godeffroy, vol., 8 (16), 1909. p. 266 (Samoa, Fiji, Solomons, Ellice Islands, Vanicolo, Pelew Islands, East Indies).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 372 (Lombok, Salibabu, Saleyer, Binongka, Timor, Rotti).

Choerojulis trimaculata Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina).

Halichoeres trimaculata Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Cagayancillo).

Julis (*Halichoeres*) *spilurus* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 252. Neira, Banda.

Depth 3¼ to 3⅞; head 2¾ to 3⅛, width 2⅓ to 2½. Snout 3 to 3½; eye 3½ to 5, 1⅛ to 1¾ in snout, equals or little greater than

interorbital; maxillary extends ⅔ to eye, 3¾ to 4½ in head; interorbital 4½ to 5⅔, broadly convex. Gill rakers 6+13, lanceolate, slender.

Scales in lateral line 21, 4 or 5+2; 3 scales above lateral line, 9 below, 7 or 8 predorsal. Scales with 25 to 28 basal radiating striae, apical 17 to 20; circuli very fine.

D. IX, 11, 1, ninth spine 2⅘ to 3⅙ in head, first ray 2⅕ to 2⅗; A. II, 11, 1, second spine 3⅔ to 4½, first ray 3⅕ to 3⅔; caudal 1⅓ to 1⅔, convex behind; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1½ to 1⅞; ventral 1⅗ to 1⅞.

Body drab gray, pale below, each scale with subterminal deep drab gray vertical streak, bordered behind with gray white line. Predorsal and humeral region with pearl gray blotches, on head as pearl gray band from near snout tip along lower eye edge to front of opercle, sometimes separated as blotch on latter; also 2 or 3 more on opercle. Gray blue line from front of snout above to upper front eye edge. White branch obliquely down from pectoral axil to front of postventral. Dusky blotch at fifth or sixth scale of lateral line and another little larger at upper side of caudal peduncle above lateral line.

Fins all very dilute brownish. Dorsals with 2 longitudinal white lines on spinous fin and 3 on rayed portion, basal more or less reticulate with median. Anals with white subbasal longitudinal line and median gray longitudinal band. Paired fins and caudal uniform. Some examples with small dusky spot also at upper median caudal rays basally.

East Indies, Micronesia, Fiji, Samoa.

20100 and 20101. Cagayán, Sulu Island. January 8, 1909. Length, 88 to 93 mm. [1067.] Pale dusky green; yellowish shades on side of head and body anteriorly; stripes and spots of head bright reddish orange, becoming slightly tawny on preorbital; small black spot less than eye on anterior portion of lateral line; another on upper part of peduncle larger than eye fading to bronzy; throat with orange line extending on breast, latter with yellowish wash; lower side above anal whitish. Dorsal body color, soft tips hyaline; narrow orange or geranium bar crossing tips of spines carried as inframarginal bar on soft portion, another bar near base of fin and one through central portion, last two fusing on second spine. Caudal pale, more or less orange at base. Distal third of anal hyaline pink; bar of geranium red at base, middle pale yellowish green color of dorsal; basal bar similar to dorsal bars in coloration but somewhat brighter; bases of scales on posterior portion of body ocher on pink bar.

1 example, Great Tobea Island. December 15, 1909. Length, 54 mm.

2 examples, Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 21 to 41 mm.

52226 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 90 to 104 mm. 9 examples.

56984 U.S.N.M. Apia. Bureau of Fisheries. Length, 54 to 101 mm. 7 examples.

65862 U.S.N.M. Makemo, Paumotu. *Albatross* collection. Length, 71 or 72 mm. 2 examples.

71560 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 82 to 150 mm. 8 examples.

31187 to 31191 A.N.S.P. Bureau of Fisheries. Length, 38 to 72 mm.

31296 to 31302 A.N.S.P. Apia. Bureau of Fisheries. Length, 33 to 71 mm.

HALICHOERES LEUCURUS (Walbaum)

Labrus leucurus Walbaum, Artedi Pisc., vol. 3, 1792, p. 249 (on Gronow, Mus. Ichth., vol. 2, 1754–1756, p. 28, No. 183; Zoophylac., 1763, No. 240).

Labrus purpurescens Schneider, Syst. Ichth. Bloch, 1801, p. 262. No locality (on Seba, Thesaur., vol. 3, 1758, p. 95, pl. 31, fig. 6).

Platyglossus purpurescens Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 108, pl. 45, fig. 1 (Java, Bawean, Banka, Celebes, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 158 (East Indies).

Platyglossus purpurascens Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Mysore).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Amboina).

Halichoeres purpurescens Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).

Julis (*Halichoeres*) *temminckii* Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 491. Batavia.

Julis (*Halichoeres*) *kallopisos* Bleeker, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 348. Amboina.

Depth 3⅓ to 3⅔; head 3 to 3⅕, width 2⅗ to 2⅔. Snout 2⅞ to 3; eye 5⅛ to 6, 1⅔ to 1⅘ in snout, 1 to 1⅕ in interorbital; maxillary reaches ⅗ to ⅔ to eye, 3⅔ to 4⅛ in head; interorbital 4½ to 5, convex. Gill rakers 6+11, lanceolate, short.

Scales in lateral line 21, 5+1; 4 scales above lateral line, 9 below, 9 to 11 predorsal. Scales with 27 to 31 basal radiating striae, apical 28 to 36; circuli fine.

D. IX, 12, 1, ninth spine 2⅔ to 3⅛ in head, first ray 2⅓ to 2½; A. III, 13, 1, third spine 4⅔ to 4½, first ray 2⅔ to 3⅓; caudal 1⅕ to 1¼, convex behind; least depth of caudal peduncle 1⅞ to 2; pectoral 1¾; ventral 1¼ to 1⅔.

Brown, each scale with basal spots of darker. Some obscure scattered deep bluish spots on predorsal. Upper surface of head with bluish spots; blue bar from front of maxillary to eye and 1 postocular across opercle, also 2 horizontal blue lines across cheek. Two or 3 short bluish bands on chest and breast anteriorly each side. Iris pale yellowish. Fins all pale. Dorsals and anals with oblique gray bars, most distinct basally; black blotch subbasal on first 2 dorsal membranes. Pectoral with broad neutral black triangular basal blotch at origin, base of fin white.

East Indies. At present the dark caudal spots, as shown in Bleeker's figure, not evident. Also Bleeker does not show the black blotch at the front of the spinous dorsal.

16037. Sulade Island. September 18, 1909. Length, 118 mm. [1949.] Green above, paler below, side of head becoming yellow; bases of scales with somewhat reddish vertical bar; head with broad orange spots and stripes; scattered stripes on top of head between eyes, about half diameter of eye; broad stripe across preorbital, one in continuation of this behind eye, separated from orbit about distance of pupil; another from lower edge of eye toward point of opercle; tip of opercle orange; broad stripe from corner of mouth slightly curving downward to opposite lower edge of pectoral base; obscure stripe along lower edge of cheek. Dorsal pale greenish, with oblique vermilion bars extending downward and backward; black spot on base of first two membranes, above lemon yellow; tips of membranes scarlet. Caudal emerald, crossed by four pale red bars, tip of similar color, joined by cross lines with adjacent bar. Anal similar to soft dorsal, but paler. Ventrals very pale emerald hyaline, dash of red in second membrane. Pectorals hyaline black across base exteriorly.

14295. Teomabal Island. September 18, 1909. Length, 118 mm.

56177 U.S.N.M. Luzon. Philippine Commission. Length, 122 mm.

HALICHOERES KALLOCHROMA (Bleeker)

Julis (*Halichoeres*) *kallochroma* Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1858, p. 289. Priaman, Sumatra.

Platyglossus kallochroma Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 108, pl. 42, fig. 4 (Sumatra and Nias).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 159 (East Indies).

Platyglossus flos-corallis Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 299, pl. 46, fig. 2. Pago Pago, Samoa.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 269 (on above).

Depth 3 to 3⅙; head 3 to 3⅙, width, 2⅖ to 2½. Snout 2⅞ to 3; eye 5 to 5⅘, 1⅘ to 1⅞ in snout, 1⅙ to 1¼ in interorbital; maxillary reaches half way to eye, 4⅘ to 5 in head; interorbital 4⅙ to 4¾, convex. Gill rakers 6+12, short weak points.

Scales in lateral line 22 or 23, 5+1; 4 scales above lateral line, 9 or 10 below, 9 or 10 predorsal. Scales with 30 to 46 basal radiating striae, apical 25 to 37; circuli very fine.

D. IX, 12, 1 or 13, 1, ninth spine 3 to 3¼ in head, first ray 2⅔; A. III, 12, 1, third spine 4⅛ to 5¼, first ray 3⅛ to 3⅕; caudal 1⅕ to 1¼, convex behind; least depth of caudal peduncle 2 to 2⅛; pectoral 1½ to 1⅔; ventral 1¼ to 1⅓.

Body brown generally. Each row of scales on trunk with small round grayish basal spot, on side of abdomen variously larger. Head bluish, with 4 or 5 longitudinal brown lines, variable, 1 always from rictus toward pectoral origin. On side of chest and breast and below pectoral base several distinct longitudinal brown lines, sometimes extending well back towards anal. Dorsals and anals dark heliotrope purple, variously spotted and with short bars of deep brown; edges of fins broadly creamy. Caudal with broad cuneate blotch of dark heliotrope-purple, blotched, spotted or barred with deeper or brownish; margin of fin creamy, especially each corner. Paired fins pale brownish. Pectoral with neutral black blotch at origin. Iris pale straw color.

East Indies, Samoa. We follow Günther in placing *Platyglossus flos-corallis* Jordan and Seale as a synonym of the present species.

296, 297. Busin Harbor, Burias Island. March 8, 1909. Length, 110 to 117 mm.
8371. Busin Harbor. April 22, 1908. Length, 116 mm.
21626. Caracaran, Batan Island. June 8, 1909. Length, 118 mm.
9912. Inamucan Bay, Mindanao. August 8, 1909. Length, 107 mm.
16160. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 109 mm.
10539. Polloc, Mindanao. May 22, 1908. Length, 100 mm.
14470. Port Palapag. June 2, 1909. Length, 99 mm.
11898. San Miguel Harbor. April 21, 1908. Length, 122 mm.
12682. San Miguel Island. June 4, 1909. Length 123 mm.
20971. Santa Cruz Island, Marinduque. April 24, 1908. Length, 109 mm.
51744. U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 72 mm. Type of *Platyglossus flos-corallis*.

HALICHOERES MELANURUS (Bleeker)

Julis (*Halichoeres*) *melanurus* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 251. Neira, Banda.

Platyglossus melanurus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 109, pl. 46, fig. 1 (Bawean, Celebes, Sangi, Solor, Timor, Buru, Amboina, Banda, Goram).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 148 (Amboina); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 265 (Ponape).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 375 (Elat).

Depth $2\frac{9}{10}$ to $3\frac{1}{3}$; head $3\frac{1}{5}$ to $3\frac{2}{5}$, width $2\frac{1}{8}$ to $2\frac{2}{3}$. Snout $2\frac{7}{8}$ to 3; eye 5 to $5\frac{3}{4}$, $1\frac{2}{3}$ to $1\frac{7}{8}$ in snout, 1 to $1\frac{1}{5}$ in interorbital; maxillary reaches $\frac{2}{3}$ to eye, $3\frac{4}{5}$ to $4\frac{1}{5}$ in head; interorbital 4 to $4\frac{2}{3}$, convex. Gill rakers 4+8 short points.

Scales in lateral line 22, 4 or 5+1 or 2; 4 scales above lateral line, 9 below, 9 or 10 predorsal. Scales with 27 or 28 basal radiating striae, apical 24 to 26; circuli fine.

D. IX, 12, 1, ninth spine $2\frac{2}{5}$ to $2\frac{3}{5}$ in head, first ray $1\frac{7}{8}$ to 2; A. III, 12, 1, third spine $3\frac{2}{5}$ to $3\frac{4}{5}$, first ray $2\frac{1}{4}$ to $2\frac{2}{5}$; caudal $1\frac{1}{6}$ to $1\frac{1}{3}$, convex behind; least depth of caudal peduncle 2 to $2\frac{2}{5}$; pectoral $1\frac{1}{2}$ to $1\frac{2}{3}$; ventral $3\frac{1}{4}$ to $3\frac{4}{5}$ in combined head and body.

Brown generally, scarcely paler below. Along back 6 short vertical pale brown narrow streaks, not extending below median axis of body. On trunk 9 rather broad heliotrope purple longitudinal bands, lower extending on head, also few of uppermost and 1 extends forward below eye from pectoral base and thence to rictus. Iris pale yellowish. Vertical fins all whitish generally. Median brown band whole length of dorsals, though little below middle of soft dorsal, and blackish on first 1 or 2 membranes of spinous dorsal; both dorsals marginally with 2 whitish longitudinal narrow bands. Anal with heliotrope purple basal band and outer half of fin with 3 longitudinal brown lines. Caudal with median blackish blotch behind, with 2 or 3 invading grayish transverse bands. Paired fins grayish. Pectoral origin with small blackish spot.

East Indies and Micronesia.

13714. Alimango Bay, Burias Island. March 5, 1909. Length, 101 mm.
1 example, Cataingan Bay, Masbate. April 18, 1908. Length, 85 mm.
8250 and 8251. Catbalogan, Samar. April 15, 1908. Length, 115 mm.
1 example, Little Santa Cruz, Zamboanga. May 26, 1908. Length, 105 mm.
15963. Masbate Reef. April 20, 1908. Length, 82 mm.
20672. Port Banalacan, Marinduque. February 23, 1909. Length, 61 mm. [1166.] Scarlet stripes on head becoming more dusky on sides and posterior portion of body, wide as interspaces. Blue between red stripes on head and bright green line on blue from mouth corner under eye to opercle point. Blue between red stripes on body, more dusky posteriorly and light below. Isthmus blue. Dorsal edge light blue, base green, then blue edged blue black; median stripe in front blue edged blue black; median stripe posteriorly green edged blue, then blue black. Black blue-edged ocellus on upper caudal base; fin margin blue green at tips, black above; brick-red and blue stripes on caudal with green streaks in centers of blue stripes near fin base. Anal with base and edge blue; central green stripe and light blue edges with blue black; narrow blue stripe, narrowly edged black between central green stripe and outer blue edge, interspaces brick red. Pectoral with small blue spot at upper corner of axil, base yellow, rest of fin hyaline. First ventral ray purple-blue, rest of fin green.
21630. Port Jamelo, Luzon. July 13, 1908. Length, 87 mm.
20767. Pujada Bay. May 15, 1908. Length, 86 mm.
20003. San Miguel Harbor, Ticao Harbor. April 21, 1908. Length, 74 mm.
21871. Seingaan Island. September 21, 1909. Length, 96 mm.
1 example, Surigao, Mindanao. May 8, 1908. Length, 97 mm.
12381. Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 80 mm.
16272. Teomabal Island. September 18, 1909. Length, 90 mm.
10890. Tilig, Lubang. July 15, 1908. Length, 92 mm.
12708. Tumindao Island, reefs south lagoon. February 26, 1908. Length, 89 mm. [311]. Ground color showing mostly as stripes ranging from dull vermilion and scarlet on head to dusky brick red posteriorly; anteriorly with many bright grass green stripes equal to interspaces in width; about 4 or 5 cross-bars of green, first two from base of dorsal to below lateral line, the next two to axial line; short bar at axil of dorsal; median line on forehead, greenish blue, reaching front of dorsal; snout blue continued backward above eyes and shading into green on back of head; chin pale blue, color continued backward as margin about the spatulate green stripe lying under eye and across middle of opercle; another stripe of green bordered by blue lies across preopercle and subopercle; median stripe of bright blue on throat, somewhat broken across breast. Dorsal bright green at base, followed by brick red bar bordered with darker, then yellowish green bordered by blue; on distal half two lighter red bars and two narrower blue ones, last margin; median green bar becomes bluish on anterior two membranes. Caudal marked at base by yellowish green, bordered narrowly blue; latter as median stripe and as half bars on base of each lobe, beyond median portion of fin black, reddish brown on side portions, entire fin tipped blue. Anal like dorsal. Ventral grass green, edged brown and blue. Pectoral dusky hyaline, axil and base bright cadmium and spot at upper corner of base. Iris bluish green, inner margin of red.

HALICHOERES RICHMONDI, new species

Depth $2\frac{9}{10}$ to $3\frac{2}{5}$; head $3\frac{1}{4}$ to $3\frac{2}{5}$, width $2\frac{2}{3}$. Snout $2\frac{3}{5}$ to $2\frac{3}{4}$; eye $6\frac{1}{4}$ to $6\frac{2}{5}$, $2\frac{1}{4}$ to $2\frac{3}{4}$ in snout, $1\frac{1}{2}$ to $1\frac{2}{3}$ in interorbital; maxillary reaches $\frac{2}{3}$ to eye, $3\frac{3}{4}$ to 4 in head; teeth uniserial, rather

slender, 2 canines in front of each jaw and posterior canine each side above directed forward; interorbital 4 to 4½, convex. Gill rakers 3+12, short, robust points.

Scales in lateral line 22, 5 or 6+1; 4 scales above lateral line, 9 or 10 below, 12 to 14 predorsal. Scales with 43 to 48 basal radiating striae, apical 34 or 35; circuli fine.

D. IX, 12, 1, ninth spine 3⅔ to 3⅘ in head, first ray 2⅞ to 3⅛; A. III, 12, 1, third spine 5 to 5½, first ray 3⅙ to 3⅕; caudal 1⅓ to 1½, convex behind; least depth of caudal peduncle 1⅞ to 2; pectoral 1¾ to 1⅘, rays 11, 12; ventral 1⅕ to 1¼, rays I, 15.

Body brown generally. Each row of scales on trunk with narrow deeper brown median line, including in its course blue basal spot to scale, but little wider than width of band; these bands all extend as more or less narrow bands on head longitudinally. On head and breast ground color deep neutral slaty. Postocular pale brown band from hind eye edge back to suprascapula and cuneated brownish white blotch above pectoral axil. Dorsals and anals slaty, with narrow creamy margins; each fin with 3 or 4 longitudinal dusky lines, variously broken, waved, as spots. Caudal slaty with parallel narrow horizontal bluish lines, variously broken or as spots; margin broadly creamy. Paired fins creamy basally, terminally grayish and first branched ray grayish.

Known only from the examples listed below. They differ from *Halichoeres marginatus* in color-pattern, the pectoral base pale, also 2 large pale blotches on the opercle and caudal base spotted with bluish, without pale area and blue lines on head continuous with those on the predorsal and breast.

Type.—Cat. No. 89971, U.S.N.M.

6358. Inamucan Bay, Mindanao. August 8, 1909. Length, 158 mm. Type.
8832. Mahinog, Camiguin Island. August 3, 1909. Length, 152 mm. Paratype.
16233. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 143 mm.

(For Dr. Charles W. Richmond, United States National Museum.)

HALICHOERES MELANOCHIR, new species

Depth 2⅘ to 2⅞; head 3 to 3⅛; width 2⅙ to 2½. Snout 3 to 3⅙; eye 4⅗ to 5, 1½ to 1⅗ in snout, 1 to 1⅛ in interorbital; maxillary reaches ⅗ to ¾ to eye, 4 to 4⅓ in head; interorbital 4⅛ to 4½, convex. Gill rakers 6+8, lanceolate, short, about half long as gill filaments.

Scales in lateral line 22, 5+2; 5 scales above lateral line, 10 below, 10 predorsal. Scales with 19 to 25 basal radiating striae, apical 27 to 30; circuli fine.

D. IX, 12, 1, ninth spine 3 to 3⅓ in head, first ray 2¼ to 2⅗; A. III, 12, 1, third spine 3⅔ to 4½, first ray 2⅓ to 2½; caudal 1¼ to 1⅓, truncate, little convex behind as expanded; least depth of caudal peduncle 1⅘ to 1⅝; pectoral 1⅓ to 1⅔; ventral 1⅗ to 1⅔.

Chocolate to vandyke brown, little paler below. Back with small blue black spot or dot at base of each scale, not extending on caudal peduncle and not much posterior of depressed pectoral in smaller examples. Side of head with 6 or 7 horizontal narrow blue lines, upper or those above eye more or less broken into dots or short bars. Iris deep brown. Lower surface of head but little paler than upper. Dorsals and anals very pale, former with 5 and latter with 4 longitudinal brown bands of which outer narrowest. At front of spinous dorsal second membrane with median round blackish blotch. Largest example also with small blackish spot, about size of pupil, at bases of uppermost caudal rays. Paired fins pale brownish, entire base of pectoral broadly blackish.

Known from the following examples. It is distinguished by its black based pectorals and dark dotted back.

Type.—Cat. No. 89972, U.S.N.M.

17525. Lampinigan Island. September 11, 1909. Length, 126 mm. Type.
2373 (Dr. 1572). Length, 115 mm. Paratype.
[1647.] Maculabo. June 14, 1909. Length, 110 mm. Paratype. Smoky purplish; on hind part of body fins with narrow orange bar showing rather obscurely; on upper and front part each scale with black speck in base, forming rows; side of head with narrow obscure reddish stripes, one across preorbital, 3 on cheek and opercle, another behind eye. Dorsal body color, submargin almost scarlet and four irregular undulating narrow scarlet bars across body of fin, reduced to three posteriorly, lower forms arches from base of one ray to that of next. Caudal rays olive yellow, membranes dull scarlet; shaded deeper at edges of fin. Anal similar to dorsal, the bars broader and less numerous, but two other than submarginal. Ventrals orange, fronts narrowly dark. Pectorals hyaline apple green, base very dark purple, almost black. Throat slightly bluish.

(Μέλας, black; χειρ, hand; with reference to the blackish base of the pectoral fin.)

HALICHOERES MARGINATUS Rüppell

Halichocres marginatus Rüppell, Neue Wirbelth., Fische, 1835, p. 16. Mohila, Massaua, Red Sea.

Julis marginatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 490 (copied).

Platyglossus marginatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 109, pl. 41, fig. 3 (Java, Sumatra, Batu, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 160 (Mauritius and Ceylon).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 545 (Koseir, Red Sea).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 411 (Misol, Moluccas).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Day, Fishes of India, pt. 3, 1877, p. 398, p. 84, figs. 5–6 (Malay Archipelago, Andamans).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Mysore).—Day, Fauna British India, vol. 2, 1889, p. 405.—Boulenger, Proc. Zool. Soc. London, 1889, p. 240 (Muscat).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 299, pl. 46, fig. 1 (Apia).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 271, pl. 143, fig. C (Society Islands, Samoa).

Julis annularis (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 482. Java.

Depth 2⅓ to 2½; head 3¼ to 3½, width 2 to 2⅙. Snout 2⅞ 3⅓; eye 5 to 5⅖, 1¼ to 1⅘ in snout, 1¼ to 1⅖ in interorbital; maxillary reaches ⅗ to eye, 4⅔ to 4⅞ in head; interorbital 3⅘ to 4, convex. Gill rakers 6+11, lanceolate, short.

Scales in lateral line 21 to 23, 5+1; 5 or 6 scales above lateral line, 10 or 11 below, 9 or 10 predorsal. Scales with 33 to 47 basal radiating striae, 26 to 30 apical; circuli fine.

D. IX, 14, 1, ninth spine 2½ to 2⅔ in head, first ray 1⅘ to 1⅞; A. III, 12, 1, third spine 4 to 4⅕, first ray 2⅛ to 2¼; caudal 1⅛ to 1⅕, convex behind; least depth of caudal peduncle 1⅘ to 1⅞; pectoral 1⅙ to 1⅕; ventral 1 to 1⅙.

Deep brown generally, each scale with deep blue vertical line or bar and generally scale darker basally. Head with many slightly inclined deep lines or bands, variably broken or incomplete. Iris deep brown. Edges of vertical fins all buff, broader on caudal which also with basal brown crescent. Otherwise vertical fins deep neutral dusky, with numerous deep blue oblique bands on dorsals and anals and as vertical bands in dark region of caudal. Outer hind edges of caudal deeper brown than narrow submarginal line. Paired fins deep neutral brown, pectorals darker basally.

Red Sea, Mauritius, Ceylon, East Indies, Polynesia.

16710. Butauanan Island. June 12, 1909. Length, 157 mm. [1644.] Dark green, scales with vertical bars of indigo and dull brick red. Head and front of body with indigo stripes breaking into spots behind over pectoral. Dorsal edge olive yellow, sky blue and black; body of fin body color, with oblique bar of emerald and black or indigo lines at base; outer half with small round dots same color. Anal similar but bars brick and larger fusing on terminal half and encircling red dots of body color. Caudal olive yellow, sky blue, black at tip, body indigo and brick green blotch at base. Pectoral hyaline black, yellow spot at upper base. Ventral dull olive, black stripe in front.

8473. Santo Domingo de Basoo, Batan Island. November 7, 1908. Length, 128 mm.

11244. Verde del Sur Island. April 6, 1909. Length, 121 mm.

52209 U.S.N.M. Apia. Bureau of Fisheries. Length, 128 mm.

HALICHOERES VROLICKII (Bleeker)

Julis (*Halichoeres*) *vrolickii* Bleeker, Nat. Tijds. Ned. Indie, vol. 8, 1855, p. 323. Batu Archipelago.

Platyglossus vrolickii Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 110, pl. 42, fig. 2 (Bawean, Batu, Nias, Banka).

Platyglossus vrolickii Günther, Cat. Fish. Brit. Mus., vol. 1, 1862, p. 159 (East Indies).

Platyglossus ubayensis Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1873, p. 104. Ubay, Bohol.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 553 (Ubay, Bohol).

Depth 4¼; head 4½; D. IX, 12; A. III, 12; scales in lateral line 28; caudal rounded; first ventral ray produced.

Head yellow, with reddish violet bands edged darker; 1 from snout to eye, second curved from below eye to subopercle, 2 parallel behind

eye united by transverse spot, fourth on snout and forehead, fifth transversely on opercle membrane. Front part of back with 6 to 8 reddish violet longitudinal bands formed by confluent spots; hind part of back with 4 yellow cross bars edged with violet, scarcely extending below lateral line; each scale on sides with violet transverse spot. Dorsal with 3 rows of red blue edged ocelli and blue intramarginal line. Anal with 2 or 3 undulated red blue edged bands and with a blue intramarginal line. Caudal with similar ocelli as dorsal. Pectoral with black spot superiorly at base. Black ocellus superiorly at caudal root. (Günther.)

East Indies. Known from the Philippines by Cartier's description of his nominal *Platyglossus ubayensis*, which we place with the present species. He describes above median line each side of body with 3 silvery white, irregular, small spots, first under last dorsal spines, second under fifth dorsal ray and third below ninth dorsal ray. His example 80 mm. long. Bleeker gives the maximum size 102 mm.

HALICHOERES NOTOPSIS (Valenciennes)

Julis notopsis (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 485. Guam.

Platyglossus notopsis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 111, pl. 41, figs. 1–2 (Java, Bawean, Sumatra, Batu, Biliton, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 154 (Java, Sumatra, Batu).—Day, Fishes of India, pt. 3, 1877, p. 398, pl. 84, fig. 4; Fauna British India, vol. 2, 1889, p. 404.—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Calayan).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 268, pl. 142, fig. A. (Society Islands).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 130 (Saonek).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 375 (Savu).

Julis (*Halichoeres*) *phaiopus* Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 291. Cauer, Sumatra.

Depth 3 to 3⅛; head 2⅗ to 2¾, width 2⅖ to 2½. Snout 3⅖ to 3½; eye 3⅖ to 4, 1 in snout; maxillary reaches ¾ to eye, 4⅛ to 4¾ in head; interorbital 4 to 4¼, convex. Gill rakers 7+9, lanceolate, short.

Scales in lateral line 22, 5+1; 5 scales above lateral line, 10 below, 10 predorsal. Scales with 19 or 20 basal radiating striae, apical 12 to 14; circuli fine, coarser apically.

D. IX, 12, 1, ninth spine 2¾ to 2⅘ in head, first ray 2⅛ to 2¼; A. III, 12, 1, third spine 3⅖ to 3⅘, first ray 2⅖ to 2⅔; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2⅖ to 2½; pectoral 1⅗ to 1¾; ventral 2⅙ to 2⅕.

Body chocolate generally. About 6 white longitudinal lines across head that usually become broken as spots. Black ocellus, larger than eye, at front of soft dorsal. Also black ocellus, smaller, at front of spinous dorsal. Dorsals and anals dark brown, spotted whitish. Caudal white. Pectoral pale grayish. Ventral dusky. Iris brown.

East Indies, Guam, Society Islands. Our examples agree in most every way with Bleeker's figure of the young.

1 example, Batan Island. July 22, 1909. Length, 43 mm.

1 example, Caracaran Bay, Batan Island. June 8, 1909. Length, 95 mm. Body verdigris, alternated by reddish brown stripes not occupying any special relation to scale rows; median dorsal stripe green, then nine brownish stripes; brown on back broken by four saddles of bright green, first under last dorsal spine, second under fifth and sixth rays, third under ninth and tenth and fourth in axil; additional double spot on posterior portion of peduncle duplicated below; browns fuse posteriorly and become slaty, obliterating green largely except median lateral stripe which extends from caudal base to third saddle noted above, which scarcely equals eye diameter; continuation of green turns blue on head; browns become brighter; in stripe through pectoral base scarlet on opercle, becoming duller again across cheek; tip of opercle dusky vermilion; opercle otherwise lemon yellow. Dorsal blue at tip, green at base; red brown bar equal to pupil in diameter passes through basal half, limited each side by narrow blue line; central bar of equal width of yellowish green or emerald; submarginal bar of three distinct parts, outer two red brown, central blue; browns in all bars darker along edges; extreme caudal tip whitish blue, body of fin pale blue crossed by two oblique bars through lobes and two stripes through center of fin; fuse into a large black blotch on central submargin. Anal similar to dorsal. Ventrals green, dusky line through extended rays. Pectorals dusky hyaline, base and broad axillary blotch of bright yellow; small black blotch in upper edge of base.

3 examples, Sablayan, Mindoro. December 13, 1909. Length, 36 to 44 mm.

52221 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 28 to 101 mm. 7 examples.

71694 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 14 to 66 mm. 18 examples.

31192 to 31195 A.N.S.P. Apia. Bureau of Fisheries. Length, 30 to 63 mm.

51103 to 51105 A.N.S.P. Pago Pago. Capt. C. F. Silvester.

HALICHOERES HOEVENII (Bleeker)

Julis (*Halichoeres*) *hoevenii* Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 250. Neira, Banda.

Platyglossus hoevenii Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 111, pl. 42, fig. 3 (Java, Bawean, Sumatra, Nias, Banka, Solo, Ternate, Buru, Amboina, Haruko, Ceram, Goram, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 153 (East Indies); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 268 (East Indies, Pelew Islands, Samoa, Mortlock).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island); Siboga Exp., vol. 57, Fische, 1913, p. 375 (Elat).

Depth 3¼ to 3¾; head 2⅘ to 3¼, width 2¼ to 2¾. Snout 3 to 3¾; eye 4 to 4¾, 1⅕ to 1½ in snout, 1 to 1¼ in interorbital; maxillary reaches ¾ to eye, 4 to 5 in head; interorbital 3¾ to 5, convex. Gill rakers 5+7, lanceolate, short, flexible.

Scales in lateral line 21 or 22, 5+2; 3 scales above lateral line, 9 below, 12 predorsal. Scales with 26 to 28 basal radiating striae, apical 21 to 28; circuli very fine.

D. IX, 12, 1, ninth spine 2⅖ to 2⅗ in head, first ray 2¼; A. III, 11, 1 or 12, 1, third spine 4 to 4⅗, first ray 2⅔ to 3⅙; caudal 1¼

to 1⅓, convex behind; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅙; pectoral 1⅗ to 1⅔; ventral 1⅔ to 1¾.

Brown, with 9 pale longitudinal lines, slightly variable, though little narrower on top of head. On dorsals 3 or 4 longitudinal pale bands, narrow basally on fin. Anal with 2 or 3 longitudinal pale bands. Small black ocellus on first membrane of spinous dorsal, another larger at front of soft dorsal medianly and third at base of caudal above, all or any of which may be absent. Caudal dusky subterminally, otherwise pale or yellowish white, with traces of faint transverse narrow bands. Pectoral and ventral uniformly pale brown, former with or without small narrow blackish triangle at fin origin. Small purplish black bar close behind eye, size ⅔ eye-diameter.

East Indies, Micronesia, Samoa. A very variable species in color-pattern. Often black ocelli on dorsals and caudal and at pectoral base small black spot, variably present or absent. We follow Günther in leaving *Julis* (*Halichoeres*) *chrysotaenia* Bleeker[21] distinct, though Bleeker later placed it as a synonym of the present species.

3 examples, Cataingan Bay, Masbate. April 8, 1908. Length, 52 to 65 mm.
2 examples, Cataingan Bay. April 17, 1908. Length, 56 to 72 mm.
1 example, Cataingan Bay. April 18, 1908. Length, 51 mm.
1 example, Cataingan Bay. April 19, 1908. Length, 57 mm.
8249. Catbalogan, Samar. April 15, 1908. Length, 88 mm.
137. Endeavor Strait. December 23, 1908. Length, 97 mm.
7273. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 72 mm.
16158. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 93 mm. [529.] Stripes slaty blue, limited by darker edges from dull yellowish interspaces. Head and body uniform, except orange caudal base. Dorsal orange, tipped with white on a black line, bars like body stripes; black ocellus in middle of fin, rim pale blue; black blotch at base of first spine. Anal orange, tipped like dorsal. Pectoral bluish white, ocellus basal, like dorsal. Pectoral hyaline-straw. Ventral yellowish. This fish travels in schools, similar to Caesio. Only one example taken; apparently the school ran in after the shot exploded.
1 example, Ragay Bay, Ragay Gulf, Luzon. March 10, 1909. Length, 80 mm. [1286.] Ground color pale slaty with numerous orange brown stripes, about 10 or 12; on top of head beginning near snout, on side of head behind maxillary and eye; lower head and belly pale bluish; dusky bar behind eye. Dorsal body color, large blotch centered yellow and white rimmed ocellus in central portion, fin much barred and obliquely streaked with orange, same color as body stripes. Caudal pale lemon yellow, bluish bar at bases of rays and small black-centered blue-rimmed ocellus on upper hind portion of peduncle. Anal pale slaty blue, with regular bars of orange, about three, two outer more or less connected by oblique cross lines; extreme margin of both anal and soft dorsal hyaline. Ventrals white. Pectorals dusky, with black triangular blotch at base; membranes hyaline.

[21] Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 488. Batavia.

22863. Opol, Mindanao. August 4, 1909. Length, 90 mm.
3 examples, Polloc, Mindanao. May 22, 1908. Length, 45 to 80 mm.
22624. Port Palapag. June 3, 1909. Length, 65 mm.
20004. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 45 to 57 mm. 2 examples.
1 example, Macassar, Celebes, Dutch East Indies. December 15, 1909. Length, 67 mm.
1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 54 mm. [2092.]
52270 U. S. N. M. Apia. Bureau of Fisheries. Length, 47 mm.

HALICHOERES MINIATUS (Valenciennes)

Julis (*Halichoeres*) *miniatus* (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. (460) 337. Java.

Halichoeres miniatus Bleeker, Atlas Ichth. Ind. Neérl., vol. 1, 1862, p. 114, pl. 41, fig. 5 (Java, Bawean, Bali, Sumatra, Batu, Borneo, Celebes, Solor, Timor, Ternate, Amboina).—Günther, Cat. Fish, Brit. Mus., vol. 4, 1862, p. 150 (Australia, China).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535 (Padang, Sumatra).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 785 (Negros).—Jordan and Seale, Bull. Bur. Fisher., 26, 1906 (1907), p. 30 (Manila and Cavite).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 266 (Calayan).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island); Siboga Exp., vol. 57, Fische, 1913, p. 371 (Savu Island, Siau, Beo, Nusa Laut).

Platyglossus miniatus Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Luzon).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 552 (Luzon, Cavite, Santa Cruz).

Choerojulis miniata Marteńs, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina River).

Depth 3⅓ to 3½; head 2¾ to 2⅘, width 2½. Snout 2¾ to 3⅓; eye 3¾ to 4⅛, 1 to 1⅕ in snout; maxillary reaches ¾ to eye, 4 to 4⅛ in head; interorbital 4 to 5½, convex. Gill rakers 6+8, short, slender points.

Scales in lateral line 22, 4+2; 3 scales above lateral line, 8 below, 8 predorsal. Scales with 19 to 21 basal radiating striae, apical 14 or 15; circuli very fine.

D. IX, 11, 1, ninth spine 3½ to 3¾ in head, first ray 2½ to 2⅘; A. III, 11, 1, third spine 3½ to 4, first ray 2⅘ to 2⅞; caudal 1⅗ to 1⅔, little convex behind; least depth of caudal peduncle 2½ to 2⅘; pectoral 1¾ to 1⅘; ventral 2⅕ to 2¼.

Dull brown, paler to whitish below. Median lateral dark brown band and 7 transverse deep brown ill-defined streaks. Some pearly spots scattered about back and in dark areas. Along lower side of trunk and tail several whitish lines and most scales on belly with basal whitish spot. Head with small deep brown preocular spot and short vertical bar of dark brown close behind eye. White line from rictus up close below eye and postocular dark bar. Fins all whitish generally. Spinous dorsal with nearly vertical dark brown transverse lines

and on soft fin largely only rays spotted with dark brown, while anal with rays only marked and spots nearly blackish and very distinct. Small black spot on membrane at front of spinous dorsal and another much larger at front of soft dorsal medially.

East Indies, Philippines, China, Australia. Distinguished from most species by the spotted anal rays and absence of a black caudal ocellus.

19 examples, Batan Island tide pools, Rapurapu Strait. June 5, 1909. Length, 27 to 55 mm. [1601.] Narrow pink stripe under eye from mouth corner branching downward at preopercle margin cross opercle; below opercle yellowish; above dusky greenish, with brownish stripes, more or less circular; top of head with numerous brownish stripes and mottlings, on rather dusky greenish ground; dash of black behind eye, parallel to hinder limb of preopercle; margins of scales on side dusky, centers dusky greenish; on lower posterior side numerous brown spots. Dorsal with dark brown oblique bars, cross three or four rays; black spot on first and second soft rays. Caudal hyaline, with numerous round black or dark brown spots on rays. Paired fins pale; yellowish under pectoral extended; abdominal region below somewhat purplish, edges of scales silvery.

26 examples, Batan Island, tide pools. July 22, 1909. Length, 29 to 71 mm.

49 examples, Canimo Island near Daet, tide pool. June 15, 1909. Length, 38 to 60 mm.

1 example, Cebu, reef opposite. April 5, 1908. Length, 60 mm.

1 example, E. Logan Psug, near Baheli River mouth. December 28, 1908. Length, 60 mm.

7 examples, Guijulugan shoal, Negros. April 2, 1908. Length, 25 to 59 mm.

50 examples, Maculabo Island, tide pools. June 14, 1909. Length, 27 to 68 mm.

1 example, Philippines. Length, 59 mm.

2 examples, Romblon. March 25, 1908. Length, 38 to 46 mm.

3 examples, Sablayan, Mindoro, tide pools. December 13, 1908. Length, 36 to 43 mm.

51971 U.S.N.M Negros. Dr. B. Dean. Bureau of Fisheries. Length, 42 to 64 mm. 3 examples.

56153 U.S.N.M. Bacon. Bureau of Fisheries. Length, 76 mm.

27712 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 58 mm.

HALICHOERES MARGARITACEUS (Valenciennes)

Julis margaritaceus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 484. Vanicolo.

Julis (*Halichoeres*) *pseudominiatus* Bleeker, Act. Soc. Sci. Ind. Néerl. (Amboina), vol. 1, 1856, p. 62. Amboina, Manado, Timor Kupang, Priaman.

Halichoeres pseudominiatus Bleeker, Atlas Ichth. Ind. Néerl., 1, 1862, p. 115, pl. 40, fig. 5 (Java, Bawean, Sumatra, Celebes, Timor, Amboina).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1915, p. 785 (Negros); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 30 (Cavite).

Platyglossus pseudominiatus Günther Cat. Fish. Brit. Mus., vol. 4, 1862, p. 151 (copied).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 371 (Beo, Sula Besi, Binongka, Nusa Laut, Tiur, Elat, Rotti).

Platyglossus opercularis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 148. Fiji and Amboina; Fishes of Zanzibar, 1866, p. 95, pl. 12, fig. 1 (Johanna Island); Cruise of Curacoa, Brenchley, 1873, p. 410 (Solomons).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (North Celebes).—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 264 (Pelew Islands, Solomons, Samoa, Fiji, Guam, Rotuma, Ruk).

Halichoeres opercularis JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Calayan).—MCCULLOCH, Proc. Linn. Soc. New South Wales, vol. 35, 1910, p. 431 (Masthead Island, Queensland).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 421 (Tanegashima); p. 507 (Okinawa).

Depth 3 to 3⅓; head 2⅔ to 2¾, width 2⅔ to 2½. Snout 3¼ to 3⅓; eye 4$\frac{1}{10}$ to 4⅖, 1⅓ to 1⅔ in snout, equals interorbital; maxillary reaches ¾ to eye, 4 to 4¼ in head; interorbital 4½ to 5⅓, convex. Gill rakers 8+12, lanceolate, short, weak.

Scales in lateral line 22 or 23, 4 or 5+2; 3 scales above lateral line, 9 below, 6 predorsal. Scales with 21 to 25 basal radiating striae, apical 19 or 20; circuli fine.

D. IX, 11, I, ninth, spine 2⅞ to 3⅛ in head, first ray 2⅓ to 2⅔; A. III, 11,I, third spine 3⅙ to 3⅔, first ray 2⅔ to 2¾; caudal 1⅔ to 1⅗, convex behind; least depth of caudal peduncle 2½ to 2¾; pectoral 1⅗ to 1⅔; ventral 2 to 2$\frac{1}{10}$.

Brown generally, whitish below. On back 5 dark blotches above lateral line; below lateral line and along middle of side 3 rows of scales each with median spot to each scale. Along lower side of trunk and tail 6 whitish blotches. Pectoral axil broadly with white and also small brown spot, followed behind by deep brown blotch. Behind this 2 parallel slightly oblique, close-set lines, sloping little forward; at next white blotch another oblique line at same angle; these white lines only extend from below median lateral axis of body. Scattered pearly scales also on caudal peduncle and along middle of side, which with large dusky area. Head with white band from rictus, below eye, to and including lower half of opercle. Dark spot, less than pupil, behind eye. Also larger dark brown blotch at pectoral base. Dorsals pale, with deep brown waved vertical bands, some paired. Small black ocellus at front of spinous dorsal and larger one at front of soft dorsal. Anal with whitish, waved vertical lines. Rays of caudal with pale spots. Other fins all pale.

East Africa to the East Indies, Japan, Micronesia, Queensland, Somoa and Fiji. Differs from *Halichoeres reichei* chiefly in the horizontal dark band across the cheek.

1597, 1612, 1614. Batan Island tide-pool. June 5, 1909. 6 examples. Length, 45 to 80 mm.

8 examples, Gubat Bay, Luzon, tide-pools. June 23, 1909. Length, 62 to 70 mm.

20114. Ulugan Bay, near Baheli River mouth. December 28, 1908. Length, 75 mm.

51960 U.S.N.M. Negros. Dr. B. Dean. Length, 45 mm. 1 example.

52194 U.S.N.M. Apia. Bureau of Fisheries. Length, 47 to 73 mm. 16 examples.
71262 U.S.N.M. Japan. Bureau of Fisheries. Length, 24 to 61 mm. 3 examples.
71706 U.S.N.M. Okinawa. *Albatross* collection. Length, 23 to 59 mm. 10 examples.
72208 U.S.N.M. Cagayancillo. R. C. McGregor. Length, 67 mm.
72266 U.S.N.M. Calayan. R. C. McGregor. Length, 76 mm.
31066 to 31080 A.N.S.P. Apia. Bureau of Fisheries. Length, 38 to 70 mm.

HALICHOERES NEBULOSUS (Valenciennes)

Julis nebulosus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 461. Bombay.

Platyglossus nebulosus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 151 (Red Sea, Amboyna; not *Halichoeres reichei*).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 544 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 400, pl. 85, fig. 2 (Malay Archipelago); Fauna British India, vol. 2, 1889, p. 407.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 265 (Ponape).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 371 (Siau, Beo, Sabibabu, Kabaena, Binongka, Nusa Laut, Tiur, Rotti).

Halichoeres nebulosus McCulloch, Proc. Linn. Soc. New South Wales, vol. 35, 1910, p. 431 (Masthead Island, Queensland).

Julis poecila Lay and Bennett, Zool. Beechey's Voy., 1839, p. 66, pl. 19, fig. 1. Near Riu-Kiu Islands.

Halichoeres poecila Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 115, pl. 39, fig. 4 (Java, Bawean, Sumatra, Batu, Bali, Borneo, Celebes, Flores, Timor, Ternate, Buru, Amboina, Goram).

Halichoeres poecilus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 785 (Negros); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 30 (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Calayan).

Platyglossus poecilus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 152 (Red Sea).—Steindachner, Sitz. Akad. Wiss. Wien, vol. 53 (1), 1866, p. 463 (Port Jackson, Australia).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Paracali, Luzon).

Choerojulis poecila Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Ternate, Amboina River).

Julis (*Halichoeres*) *harlofii* Bleeker, Verh. Batav. Genootsch. (Labroid.), vol. 22, 1849, p. 22. Pagotang, Batavia.

Julis granatinus (Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 115 (name in synonymy).

Halichoeres annulatus Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 535, pl. 20, upper fig. Padang, Sumatra.

Halichoeres daedalma Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 301, pl. 47, fig. 2. Apia and Pago Pago, Samoa.

Depth 3½ to 3¾; head 2⅔ to 2⅞, width 2½ to 2¾. Snout 3 to 3⅛; eye 4¾ to 5, 1⅖ to 1½ in snout, 1 to 1⅛ in interorbital; maxillary reaches ¾ in snout, 3¼ in head; interorbital 3⅘ to 4⅛, convex. Gill rakers 6+10, lanceolate, short.

Scales in lateral line 22, 3 or 4+2; 4 scales above lateral line, 9 below, 9 predorsal. Scales with 29 or 30 basal radiating striae, apical 24 or 25; circuli very fine.

D. IX, 11, 1, ninth spine 3¼ to 3⅘ in head, first ray 2¾ to 2⅘; A. III, 10, 1 or 11, 1, third spine 3½ to 4¾, first ray 2¾ to 3⅛; caudal 1½ to 1⅗, convex behind; least depth of caudal peduncle 2½; pectoral 1⅘ to 1⅞; ventral 1⅞ to 2⅛.

Back brown, below whitish. Deep brown obscurely defined median lateral band, with 3 or 4 blotches downward behind pectoral and on tail and caudal peduncle 3 ill-defined blotches. Short dark bar close behind eye and outer lobe of pectoral neutral dusky. Variable heliotrope gray blotches or bands on side of head. Spinous dorsal with marginal and basal row of pale spots, also median and basal longitudinal row on soft dorsal; black blotch medianly at front of soft dorsal and sometimes smaller one at front of spinous dorsal. Anal with median longitudinal gray band and basal row of white spots. Caudal pale, with 7 or 8 transverse grayish lines. Paired fins pale yellowish.

Red Sea, India, East Indies, Queensland, Riu Kiu, Micronesia, Samoa. A very handsome species, usually with a curved blue band on the cheek, sometimes forming a complete circle.

1 example, Bolalo Bay, Palawan. December 21, 1908. Length, 75 mm.

1 example, Batan Island tide-pool, Rapurapu Strait. June 5, 1909. Length, 83 mm. [1593.] Yellowish olive green, more or less washed with paler posteriorly; head with reddish marks, limited from ground color by narrow pale lines; broad stripe of ground-color across preorbital; another irregular one behind eye passing downward near opercle edge with branch forward toward eye; horseshoe lying on cheek almost completed along lower edge to form irregular circle; side of body blackish, most pronounced in central region, where extend upward to dorsal and downward to nose; posterior lateral stripe about breadth of eye; anteriorly about three times this breadth, encroaching on band of opercle; above narrow stripe of ground color dark again shows as three more or less rectangular areas at dorsal base, first extending somewhat in front of dorsal, last about equally divided between spinous and soft rayed fin; area separated by pale bars. Dorsal pale red, somewhat vermilion shade, barred and spotted with olive yellow; black blotch on first three soft rays not ocellate. Caudal pale, crossed by six or eight irregular narrow scarlet bars. Anal smoky rose, green bar on outer portion of basal half and another at base; these break on last few rays into blotches. Ventral rays pale green, except first edges reddish. Pectorals hyaline and light pink shade.

3 examples, Batan Island, tide-pool. June 8, 1909. Length, 67 to 83 mm.

8 examples, Batan Island, tide-pool. June 22, 1909. Length, 68 to 86 mm.

19 examples, Canimo Island near Daet. June 15, 1909. Length, 65 to 82 mm.

2 xamples, Gubat Bay, Luzon. June 23, 1909. Length, 98 to 100 mm.

3 examples, Guijulugan Shoal, Negros. April 2, 1908. Length, 71 to 74 mm. [828, 829.] Pale green generally on upper surfaces, becoming somewhat yellowish anteriorly and below, throat and breast nearly white. Three broken lines of bronze across upper side; 3 or 4 dusky blotches on middle of side, below 6 short whitish narrow bars across back, show whitish only as viewed

above, from side pale green; upper bronze stripe close under dorsal as oblong areas under whitish bars; second and third stripes extend along middle of side from opercle to caudal base, lower almost a continuous line; top of head with narrow reddish lines, one as inverted Y between eyes and across upper snout; broad stripe from front of eye curving up on preorbital front across maxillary; similar line from lower hind eye corner back and up to upper angle of opercle; inverted U on cheek below eye and another line curving across opercle to its lower edge; blotch on opercle flap. All lines of head about equal pupil in width, of dusky geranium red, defined by narrow black borders; ground color blue green; pale reddish triangular blotch on opercle. Dorsal green, tips hyaline; submarginally dull geranium red, narrow on spinous part; broader than pupil on soft fin; spinous fin medially with bar of dull red, broken on last spines, forming blotch on front rays beginning as continuous line again which throws oblique branches upward to submarginal band and downward to fin base; black blotch on first rays; triangular opercular blotch shows burnished metallic as seen in front. Caudal like body color, rays crossed by numerous narrow bars (6 or 7) of red becoming nearly scarlet at tips; blackish blotch on caudal peduncle at caudal base median and more obscure one between posterior ends of dorsal and anal.

6 examples, Maculabo Island. June 14, 1909. Length, 69 to 82 mm.

1 example, Mansalay, Mindoro. June 4, 1908. Length, 71 mm.

13890 and 13891. Observatory Island. December 19, 1908. Length, 80 to 90 mm.

1 example, Philippines. Length, 74 mm.

2 examples, Romblon. March 25, 1908. Length, 75 to 80 mm.

3 examples, Ulugan Bay, near Baheli River mouth. December 25, 1908. Length 80 to 87 mm.

51993 U.S.N.M. Negros. Dr. B. Dean. Length, 80 mm. 1 example.

56255 U.S.N.M. Luzon. Philippine Commission. Length, 89 mm.

31136 to 31138 A.N.S.P. Apia. Bureau of Fisheries. Length, 73 to 90 mm.

27713 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 98 mm. Type of *Halichoeres annulatus*.

27714 A.N.S.P. Padang. Messrs. Harrison and Hiller. Length, 97 mm. Paratype of *Halichoeres annulatus*.

HALICHOERES REICHEI (Bleeker)

Julis (*Halichoeres*) *reichei* Bleeker, Act. Soc. Sci. Ind. Néerl. (Bijd. Visch. Sumat.), vol. 3, 1857–58, p. 43. Trussan, West Sumatra; Amboina; Kajeli, Buru Island.

Halichoeres reichei Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 116, pl. 37, fig. 1 (Java, Bawean, Bali, Sumatra, Buru, Amboina).

Platyglossus nebulosus (not Valenciennes) Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 151 (part).—Day, Fishes of India, pt. 3, 1877, p. 400.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Sangi and Ternate).

Halichoeres nebulosus Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Cuyo).

Depth 3¼ to 3⅖; head 2¾ to 3, width 2⅖ to 2½. Snout 3 to 3⅓; eye 4⅗ to 4⅔, 1½ to 1⅗ in snout, 1⅛ to little over in interorbital; maxillary ¾ to ⅘ to eye, 3⅘ to 3⅚ in head; interorbital 5⅕ to 5⅔, broadly convex. Gill rakers 8+11, lanceolate, short.

Scales in lateral line 22, 5+1; 3 or 4 scales above lateral line, 9 below, 7 predorsal. Scales with 22 to 30 basal radiating striae, apical 19 to 30; circuli very fine.

D. IX, 11, 1, ninth spine 2⅘ to 3 in head, first ray, 2⅓ to 2⅖; A. III, 11, 1, third spine 3⅕ to 4, first ray 2⅔ to 2¾; caudal 1⅔ to 1⅗, convex behind; least depth of caudal peduncle 2⅓ to 2⅖; pectoral 1¾ to 1⅘; ventral 1⅘ to 1⅚.

Brown generally, little paler below. Forehead with some pale blue gray reticulations. Blue gray band from rictus to eye; dark vertical blue neutral bar close behind eye, with several blue postocular bars or spots, also 1 on opercular flap with blackish spot above, in front. Blue bar across opercle and another on cheek. Iris pale yellowish white. More or less dusky brown median lateral band, emphasized at middle of side with darker and as deep gray brown downward before front of anal. Back with 5 dusky brown cross-bars, connecting dark lateral band; also 2 rows of silvery spots as pair in each pale transverse band, of which 1 above and other close below lateral line. Pectoral region whitish, with dusky oblique bar down, inclined behind. Space before pectoral base white, with dusky blotch. Fins all pale. Spinous dorsal with median grayish longitudinal band, dark at front. Soft dorsal gray, with submarginal row of whitish spots and basal row of larger ones, intersections between latter much darker basally and medianly at front of soft dorsal blackish. Anal grayish, with median longitudinal white band and basal row of small white spots, 1 on each membrane. Caudal with 6 deep brown waved cross lines, indistinct or faded at upper and lower edges. Paired fins uniformly pale.

East Indian region. A very handsome species, apparently distinct from *Halichoeres nebulosus*, with which Günther identified it. We feel that the very strikingly contrasted dark ribbed design of the side, besides the dark blotch before the pectoral base will distinguish it.

1 example, Pilas Island. September 12, 1908. Length, 87 mm.
1 example, Tara Island. December 15, 1908. Length, 72 mm.
72209 U.S.N.M. Cuyo. R. C. McGregor. Length, 86 mm. 1 example.

HALICHOERES DESMOGENYS, new species

Depth 2⅞ to 3; head 3⅛ to 3¼, width 2⅓ to 2⅗. Snout 2¾ to 3; eye 4⅕ to 5, 1⅗ to 1¾ in snout, 1⅙ to 1⅕ in interorbital; maxillary reaches ⅗ to ⅔ to eye, length 4 in head; interorbital 4 to 4½, convex. Gill rakers 7+10, lanceolate, short.

Scales in lateral line 21 to 24, 5+1 or 2; 4 or 5 scales above lateral line, 10 below, 11 to 13 predorsal. Scales with 34 to 41 basal radiating striae, apical 23 or 24; circuli fine.

D. IX, 11, 1, ninth spine 2⅖ to 2⅗ in head, first ray 2⅛ to 2⅕; A. III, 11, 1, third spine 3½ to 4, first ray 2¼ to 2⅓; caudal 1⅛ to 1⅓, convex behind; least depth of caudal peduncle 2; pectoral 1⅗ to 1¾; ventral 1⅛.

Pale brown generally. Back with 7 broad deep brown vertical bands, extending down to median axis of body; below 3 or 4 lavender

longitudinal bands. Head with some bluish blotches above; blue band from snout tip to eye, 2 others from postocular, lower of which across opercle; blue arch across cheek. Iris pale straw yellow. Dorsals drab-gray, with row longitudinally of median buff spots and submarginal row of smaller ones and pale intersecting blotches of back extend little into fin bases, besides pale spot between each in dorsal base. Anals gray, with median buff longitudinal band and narrow basal band, also 1 or 2 pale streaks submarginally. Caudal grayish, with 8 transverse narrow vertical buff bands. Paired fins pale, base of pectoral with large neutral-dusky blotch, extending up over lower humeral region.

Known only from the 2 specimens listed below. The species is distinguished by the large blackish axillary blotch and its color-pattern.

Type.—Cat. No. 89973, U.S.N.M.

15107. Dupon Port, Leyte Island. March 17, 1909. Length, 113 mm. [1382.] Type. Brown of back bronzy, divided by about six green bars; first on nape, last under axil of dorsal, four intermediate about evenly spaced; bronzy color occurs on side as two or three stripes, with yellowish green interval between, fuses to form network over peduncle, with green spots and area within reticulations; top of head dusky greenish, with bright brown stripes and cross-netting; stripe from maxillary to eye across preorbital of brownish, bordered by blue, curve across lower cheek ending at edge of opercle in front of base of pectoral, nearly orange, borders blue; darker stripes behind eye, lower with blue borders; bars somewhat striped, stripes bordered by blue. Dorsal brownish orange with median row of round spots, centers green, rims blue; green bars of back extended into base of dorsal, and similar areas between each of green, all rather bordered by blue; second row of irregular spots between central row and margin of fin crosses posterior spinous portion and all soft fin; extreme margin of soft fin hyaline. Caudal brownish, with numerous wavy blue bars, broken along base of fin. Anal brownish orange, base green, with irregular green central bar; both bordered with blue; broken bluish bar through outer portion of fin, extreme margin hyaline. Ventrals greenish, with brownish stripe through first membrane. Pectorals very pale dusky greenish, base bright yellowish green, with triangular black blotch in upper part, black, extending on body above axil. Iris green and orange.

[1798]. Opol, Mindanao. August 4, 1909. Length, 112 mm. Paratype. General shades green, with about five blackish saddles from dorsal to mid region, four or five times breadth of interspace, which is plain green; on side of head and below saddles vinaceous or brownish stripes, those on head somewhat similar to dorsal, bordered somewhat by blue. Dorsal red brown with round blue spots, one at base, one through middle and small row between center and bluish margin on soft fin. Caudal alternately crossed by blue and red brown bars, irregular. Anal green, margin bluish and bluish line through outer third, otherwise outer ⅔ reddish brown and similar bar near base. Ventrals green, fronts dusky. Pectorals with blackish spot on fleshy base, yellow at root of rays, fins hyaline.

(Δεσμος, band; γένιον, cheek; with reference to the bands on the side of the head.)

HALICHOERES SOLORENSIS (Bleeker)

Julis (*Halichoeres*) *solorensis* BLEEKER, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 86. Lawajong, Solor.

Halichoeres solorensis BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 116, pl. 40, fig. 2 (Solor).

Platyglossus solorensis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 155 (copied).—KNER, Reise Novara, Fische, vol. 2, 1865, p. 255 (no locality).—WEBER, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Ambon).

Depth 3⅓ to 3½; head 2⅘ to 2⅞, width 2⅞. Snout 2½ to 2⅘; eye 4 to 4⅔, 1⅕ to 1¾ in snout, equals or little greater than interorbital; maxillary reaches ⅔ to eye, 4 to 4⅕ in head; interorbital 4¾ to 5, convex over surface. Gill rakers 6 + 9, short, lanceolate.

Scales in lateral line 21, 5 + 1; 4 scales above lateral line, 10 below, 9 predorsal. Scales with 23 to 26 basal radiating striae, apical 20 to 23; circuli fine.

D. IX, 12, ninth spine 3 to 3⅙ in head, first ray 2⅖ to 2½; A. III, 12, 1, third spine 3⅗ to 4, first ray 2¾ to 2⅘; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2⅙ to 2⅓; pectoral 1⅗ to 1⅔; ventral 1¾ to 2.

Brown generally, under surface and fins largely paler to whitish. Iris whitish. Upper surface of head with fine broken gray lines, some as spots or short bars, and, though all parallel, variable in extent. Dusky spot less than half size of pupil about midway or little advanced at each side of snout; grayish band from near front of snout to eye and another continued behind eye. Also gray longitudinal band across cheek. Dorsals with some traces of gray blotches or mottling basally. Black blotch on first 2 membranes of spinous dorsal medially, another smaller at sixth dorsal ray and also one like second at bases of supero-median caudal rays. Pectoral origin with small triangular blackish blotch.

East Indian region. Easily distinguished by the more uniform appearance and the disposition of the black spots.

22427, 22428. Jolo. March 7, 1908. Length, 54 to 74 mm.
22022. Panpan, Tara Island. September 20, 1909. Length, 75 mm.

HALICHOERES PAPILIONACEUS (Valenciennes)

Julis papilionaceus VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 484. Vanicolo.

Julis (*Halichoeres*) *schwarzii* BLEEKER, Verh. Batav. Genootsch. (Bali), vol. 22, 1849, p. 7. Boleling, Bali; Sumanap, Madura.

Halichoeres schwarzi BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 117, pl. 39, fig. 3 (Madura, Bawean, Bali, Lepar, Celebes, Timor, Ternate, Halmaheira, Batjan, Buru, Amboina, Banda).

Platyglossus schwarzii GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 149 (Amboina).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu and Manado).

Platyglossus schwarzi ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 552 (Elera).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 16, 1888, p. 130 (Saonek).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 370 (Menado. and Nusa Laut).

Choerojulis schwarzi MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina and Ternate).

Julis (*Halichoeres*) *dieschismenacanthus* BLEEKER, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 645. Neira, Banda.

Platyglossus (*Halichoeres*) *doleschalli* STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 13, 1863, p. 1190, fig. 2. Amboina.

Depth 3¼ to 3⅖; head 2¾ to 2⅞, width 2⅓ to 2½. Snout 2¾ to 3; eye 4⅖ to 4¾, 1⅗ to 1¾ in snout, equals interorbital; maxillary reaches ⅔ to ¾ to eye, 3½ to 3⅔ in head; interorbital 4⅖ to 5¼, convex. Gill rakers 7 or 8+8, short, weak points.

Scales in lateral line 21 or 22, 4+2; 3 scales above lateral line, 9 below, 8 predorsal. Scales with 23 to 28 basal radiating striae, apical 18 to 23; circuli very fine.

D. IX, 11, 1, ninth spine 2¾ to 3 in head, first ray 2⅓ to 2⅖; A. III, 11, 1, third spine 3⅔ to 5, first ray 2⅔ to 2⅞; caudal 1⅓ to 1½, convex behind; least depth of caudal peduncle 2¾ to 2⅘; pectoral 1⅘ to 1⅞; ventral 2⅛ to 2⅖.

Pale or gray white, under surface whitish. On back and upper side 7 large blotches of plumbeous. From opercle 2 horizontal plumbeous bands intercept first 2 blotches, which only evident as 2 or 3 horizontal plumbeous bars along predorsal. Along and close below upper section of lateral line plumbeous blotches all united by plumbeous line and on caudal peduncle by lower one along lower side of tail. Plumbeous postorbital bar about equal to vertical eye-diameter and variously dark. Gray line on head above may be variously broken or double, another alongside of snout and one over cheek and opercle, last variously curved along edge of gill opening. Iris yellowish. Spinous dorsal whitish, with median longitudinal grayish band, with black blotch on fourth and fifth membranes. Soft dorsal grayish basally, with 3 rows of whitish spots, basal and median rows largest. Anal grayish, with white median longitudinal band and basal row of white spots. Caudal white, with 2 or 3 transverse grayish bands and margin broadly black. Paired fins pale.

East Indian region.

1 example, Capunypugan, Mindoro. May 9, 1909. Length, 68 mm.

18383 and 18384. Cebu market. April 4, 1908. Length, 93 to 100 mm.

2 examples, Cebu market. March 20, 1909. Length, 70 to 85 mm. [1416.] Ground color green with dark purplish blotches near upper sides; head with vinaceous stripes; tip of caudal black.

2 examples, Cebu market. March 22, 1909. Length, 86 to 91 mm.

6087. Cebu market. August 12, 1909. Length, 103 mm.

2 examples, Cebu market. September 3, 1909. Length, 98 to 101 mm.

3 examples, Cebu market. September 4, 1909. Length, 50 to 70 mm.

1 example, Cebu, reef opposite. April 5, 1908. Length, 93 mm.

1 example, Cebu, reef opposite. April 7, 1908. Length, 93 mm.

6 examples, Great Tobea Island, tide-pool. December 15, 1909. Length, 60 to 70 mm.

6 examples, Great Tobea Island. December 16, 1909. Length, 59 to 68 mm.

1 example, Guijulugan, Negros. April 2, 1908. [836.]
1 example, Mactan Island. August 31, 1909. Length, 96 mm.
1 example, north end of Endeavor Strait, northwest coast of Palawan. December 22, 1908. Length, 60 mm.
2 examples, Port Matalvi, Luzon. November 23, 1908. Length, 57 to 63 mm.
72524. San Pascual, Burias Island. March 8, 1909. Length, 75 mm. [1243.] Ground color dusky green on top of head, anterior back, and posterior side; lower head apple green; breast and abdominal region more yellowish (not orange as shown in artist's sketch); markings on head vinaceous, limited by narrow black line, beyond which broader bluish border, especially marked on lower portion of head; these markings continue across shoulder, become much darker, almost lost in blackish blotches across middle which cross middle of side. Dorsal much as shown in sketch, colors somewhat brighter except reds, which rather more vinaceous. Greens of caudal pale, not so yellow as shown in sketch. Reds of anal vinaceous, rather than claret. Side almost covered by four large blackish blotches; not shown at all in sketch; reds on the middle of side shown are merged in black in specimen.
20305. Santa Cruz Island, Marinduque. April 24, 1908. Length, 70 to 78 mm. 4 examples.
3 examples, Tobea Island. December 15, 1009. Length, 65 to 71 mm.

HALICHOERES NIGRESCENS (Schneider)

Labrus nigrescens Schneider, Syst. Ichth. Bloch, 1801, p. 263. No locality. (On Seba, Thesaur., vol. 3, 1758, pl. 3, fig. 2.)

Halichoeres nigrescens Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 118, pl. 37, fig. 4 (Java, Duizend Islands, Sumatra, Singapore, Banka, Biliton, Bali, Celebes, Buru).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 29 (Manila).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bulan).

Julis dussumieri Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 478, pl. 387. Malabar.—Cantor, Journ. Asiat. Soc. Bengal, vol. 18 (2), 1849, p. 1218 (Pinang).

Platyglossus dussumieri Günther, Cat Fish. Brit. Mus., vol. 4, 1862, p. 143 (Pinang, Chusan, China, types of *Julis exornatus*).—Günther, Fishes of Zanzibar, 1866, p. 94 (Zanzibar).—Day, Fishes of India, pt. 3, 1877, p. 399, pl. 85, fig. 1.—Klunzinger, Sitzs. Akad. Wiss. Wien, vol. 80 (1), 1879, p. 404 (Port Darwin).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (no locality).—Day, Fauna British India, vol. 2, 1889, p. 405.—Regan, Journ. Bombay Nat. Hist. Soc., vol. 16, pt. 2, 1906, p. 330 (Persian Gulf), p. 332 (Karachi).

Choerojulis dussumieri Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Nagasaki Bay).

Halichoeres dussumieri Seale, Philippine Journ. Sci., vol. 9, 1914, p. 70 (Hong Kong).

Julis exornatus Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. China Jap.), 1845 (1846), p. 258. China Seas, Canton, Hong Kong.

Julis (*Halichoeres*) *notophthalmus* Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 20. Batavia.

Julis (*Halichoeres*) *mola* Bleeker, Act. Soc. Sci. Ind. Néerl. (Enum. Pisc. Ind. Arch.), vol. 6, 1859, p. 98.

Depth 2⅞ to 3½; head 3 to 3⅙, width 2 to 2½. Snout 3 to 3⅓; eye 4¼ to 6, 1⅓ to 2⅛ in snout, 1⅖ in to greater than interorbital; maxillary reaches ½ to 3 to eye, 3⅘ to 4⅔ in head; interorbital 4⅔ to 5½, convex. Gill rakers 8+11, lanceolate, short.

Scales in lateral line 20 to 22, 4 or 5+1 or 2; 4 scales above lateral line, 9 or 10 below, 11 or 12 predorsal. Scales with 27 or 28 basal radiating striae, apical 20 to 32; circuli very fine.

D. IX, 11, 1 or 12, 1, ninth spine 2⅘ to 3 in head, first ray 2$\frac{1}{10}$ to 2⅛; A. III, 12, 1, third spine 3⅗ to 4, first ray 2¼ to 2⅓; caudal 1⅛ to 1⅖, convex behind; least depth of caudal peduncle 2 to 2⅕; pectoral 1⅗ to 1⅔; ventral 1⅓ to 1¾.

Brown, little paler below, each scale with dull purplish basal spine, becoming pale brownish on lower scales. Along side, little elevated, 4 or 5 deeper cloudings or hardly blotched. Blue gray band usually from near end of snout to eye, another from end of maxillary to lower eye edge and still lower obliquely parallel across cheek. Blue gray arc on opercle and usually several postocular blue gray blotches and mostly at least one on opercular flap. Iris yellowish brown. Dorsals with subbasal row of pale or whitish spots and fin edges also pale, rest of fin light brown. Neutral black ocellus from fifth to seventh dorsal spines, or only sometimes on fifth membrane. Anals grayish, with basal row of pale or whitish spots and subbasal longitudinal whitish streak. Caudal brownish, spotted with paler and edges of fin above and below broadly whitish. Paired fins uniformly pale, with bluish-black small triangular blotch at pectoral origin.

Zanzibar, East Indies, Chusan, China, Queensland. Reported from Nagasaki, Japan.

16567. Catbalogan, Samar. April 5, 1908. Length, 156 mm. [533.] Dark green on back, becoming grass green in middle, very pale on belly, with slight brassy wash on lower side; ground color dusky purple, forming reticulation, green appearing mostly as spots about size of pupil; these fuse into lines on nape and shoulder; series of small crosses formed by large spot uniting with 3 of the smaller on middle of side, last on peduncle; side of head green, narrowly striped with purplish, with narrow blue borders; blue borders appearing obscurely throughout middle of side. Dorsal purplish, margin of fin gray; series of round greenish-yellow spots through center, bordered gray; smaller similar spots at bases of membranes; black spot on fifth membrane at middle, reds more or less vermilion anteriorly and crimson posteriorly. Caudal greenish, tip of each lobe obliquely uniform green; smoky purple blotch on lower rays; center of upper reticulated with reddish, becoming crimson above and posteriorly. Anal terminally smoky purple, margin gray, basally dusky green; reddish reticulating lines defined by pale blue. Ventral pale green, first membrane purplish. Pectoral dusky hyaline green, somewhat orange at base and with black blotch above.

20285. Cotabato, Mindanao. May 20, 1908. Length, 61 mm.

5 examples, Cotabato, below mouth of Min River. May 20, 1908. Length, 49 to 60 mm.

14747. San Januico Strait, Leyte. April 13, 1908. Length, 126 mm.

22337. Mantaquin Bay, Palawan. April 2, 1909. Length, 74 mm.

13736. Kowloon, China. September 24, 1908. Length, 124 mm.

56132. U.S.N.M. Bulan. Philippine Commission. Length, 135 mm.

27715 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 57 mm.

HALICHOERES BICOLOR (Schneider)

Labrus bicolor Schneider, Syst. Ichth. Bloch, 1801, p. 267. No locality. (On Seba, Thesaur., vol. 3, 1758, p. 96, No. 8, pl. 31, fig. 8.)

Halichoeres bicolor Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 118, pl. 39, fig. 5 (Java and Singapore).

Platyglossus bicolor Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 145 (Pinang and Singapore).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 130 (Waigiu).

Chairojulis bicolor Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Singapore and Amboina River).

Julis mola (part) Cantor, Journ. As. Soc. Bengal, vol. 18 (2), 1849 (1850), p. 1220. Pinang.

Julis margaritophorus Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 487. Batavia.

Depth 3 to 3⅘; head 3 to 3⅛, width 2⅛ to 2⅓. Snout 2⅞ to 3⅛; eye 4⅞ to 5½, 1½ to 2 in snout, 1 to 1⅖ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3⅞ to 4⅕ in head; interorbital 4 to 4¾, broadly convex. Gill rakers 8+12, short, slender.

Scales in lateral line 22, 5+1 or 2; 4 scales above lateral line, 9 below, 9 to 11 predorsal. Scales with 28 to 30 basal radiating striae, apical 24 to 28; circuli very fine.

D. IX, 12, 1, ninth spine 2⅔ to 3 in head, first ray 2⅓ to 2⅖; A. III, 10, 1, to 12, 1, third spine 3¾ to 4⅛, first ray 2½ to 2⅔; caudal 1¼ to 1⅖, little convex behind; least depth of caudal peduncle 2⅛ to 2¾; pectoral 1¾ to 1⅘; ventral 1⅖ to 1⅞.

Back brown, below whitish. Dusky brown band, more or less double at first, from snout tip along front of snout and bases of dorsals. Another from side of snout to eye, then across opercle to caudal base medianly; on head breaking at post-ocular, usually into short vertical bar close to eye; then two horizontal parallel blotches and another at opercular lobe; also blue arc across cheek from below and another pale blue blotch before pectoral on gill-cover. These markings all variably bluish and upper much darker. Spinous dorsal with blackish subbasal blotch from sixth to eighth spine and rest of fin with gray subbasal band and outer or submarginal gray line, fin otherwise pale. Soft dorsal whitish basally, with gray marginal line and median gray longitudinal band. Anal gray, with subbasal whitish band anteriorly. Other fins uniformly pale, with small neutral dusky spot at pectoral origin.

East Indies, Malacca.

8 examples, Catbalogan, Samar. April 10, 1908. Length, 88 to 100 mm.
7590 and 7593. Catbalogan. April 14, 1908. Length, 133 mm.
21189. Catbalogan. April 15, 1908. Length, 98 mm.
2 examples, Cebu market. August 27, 1909. Length, 89 to 91 mm.

HALICHOERES LEPARENSIS (Bleeker)

Julis (*Halichoeres*) *leparensis* Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 730. Lepar Island.

Halichoeres leparensis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1865, p. 119, pl. 42, fig. 5 (Java, Bawean, Sumatra, Nias, Singapore, Lepar, Biliton, Celebes, Ternate, Buru, Amboina, Saparua, Goram, Timor).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 537 (Padang).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Bacon).

Platyglossus leparensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 156 (East Indies).—Day, Fishes of India, pt. 3, 1877, p. 399, pl. 84, fig. 3; Fauna British India, vol. 2, 1889, p. 406.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 268 (East Indies, Guam).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island); Siboga Exp., vol. 57, Fische, 1913, p. 374, fig. C. (Siau, Karakelang, Salibabu, Elat).

Platyglossus reticulatus Cartier, Verh. Ges. Würzburg, vol. 5, 1874, p. 104. Cebu.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 552 (Cebu).

Depth 3¼ to 3⅓; head 2⅞ to 3, width 2⅓ to 2½. Snout 3 to 3½; eye 3⅕ to 4⅘, little greater than snout to 1⅗ in snout, little greater to 1⅛ in interorbital; maxillary reaches ⅔ to ¾ to eye, 4½ to 4⅗ in head; interorbital 5 to 5⅙, convex. Gill rakers 4+11, lanceolate, short.

Scales in lateral line 22, 3 or 4+2; 4 scales above lateral line, 8 below, 8 predorsal. Scales with 24 to 35 basal radiating striae, apical 21 to 30; circuli, fine.

D. IX, 12, 1, ninth spine 3 to 3⅛ in head, first ray 2⅖ to 2⅘; A. III, 12, 1, third spine 4 to 4⅕, first ray 2¾ to 2⅞; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅖; pectoral 1⅗ to 1¾; ventral 2⅛.

Body brown, each scale with pearly or grayish white apical spot. Head with several longitudinal grayish bands. Vertical neutral black bar close behind eye little less than vertical eye-diameter. Vertical fins all with traces of whitish spots, paired fins uniform. Black ocellus at origin of spinous dorsal, at front of soft dorsal and at base of upper caudal rays. Sometimes 2 black caudal ocelli at bases of upper caudal rays or sometimes 1 below middle of fin.

East Indies, Micronesia. Very young show median white line from side of snout along lower eye edge and back to middle of side. Also the dark postocular bar and the preocular spot dark, latter due to remaining pigment of bluish lateral band of snout to eye. Most small examples show traces of 7 dark vertical obscurely defined transverse bands.

The imperfectly described *Platyglossus reticulatus* Cartier we place as a synonym. The markings on the head are not described and though the fins are said to be transparent possibly the 3 rows of pale dorsal spots had faded out.

2 examples Batan Island. June 5, 1909. Length, 30 to 50 mm.
21701. Cabugao Bay, Catanduanes Island. June 9, 1909. Length, 65 mm.
1 example, Capunuypugan, Mindoro. May 9, 1909. Length, 58 mm.
1 example, Cataingan Bay. April, 1908. Length, 50 mm.
4 examples, Cebu, reef opposite. April 7, 1908. Length, 55 to 75 mm. [516, 517.]
1 example, Cebu, reef opposite. April 5, 1909. Length, 59 mm.
5099. Cebu market. April 5, 1908. Length, 55 mm.
1413, 1422, 20764. Cebu market. March 20, 1909. 26 examples. Length, 28 to 74 mm.
6103 to 6106. Cebu market. August 12, 1909. Length, 67 to 78 mm.
13 examples, Cebu market. September 3, 1909. Length, 67 to 84 mm.
3 examples, Cebu market. September 4, 1909. Length, 48 to 69 mm.
19124 and 19125. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 33 to 38 mm.
3 examples, El Lagan Psug, near Baheli River mouth. December 28, 1908. Length, 43 to 60 mm.
166 examples, Great Tobea Island. December 15, 1909. Length, 16 to 66 mm.
1 example, Great Tobea Island. December 16, 1909. Length, 48 mm.
19283. Inamucan Bay, Mindanao. August 9, 1909. Length, 74 mm.
14 examples, Mactan Island. August 5, 1909. Length, 18 to 88 mm.
2 examples, Mansalay, Mindoro. June 4, 1908. Length, 49 mm.
3 examples, Nogas Point, Panay. February 4, 1908. Length 52 to 70 mm.
1 example, North end of Endeavor Strait, northwest coast of Palawan. December 27, 1908. Length, 44 mm.
1 example, Pandanon Island. March 22, 1909. Length, 45 mm.
2 examples, Port Caltom. December 15, 1908. Length, 44 to 52 mm.
15 examples, Port Matalvi, Luzon. November 23, 1908. Length, 33 to 65 mm.
1 example, Ragay Bay, Ragay Gulf. March 11, 1909. Length, 35 mm.
22575. Santa Cruz Island, Marinduque, April 24, 1908. Length, 65 mm. [607.] Body apple green, with 6 irregular dark green cross-bars, nearly black in some individuals especially near center of body; lower half of head and breast bright yellow green; side of head behind eye with red stripes, also red stripe from eye to snout; interrrupted pink stripe across cheek and opercle. Dorsal bright yellow green, with fine reticulations of purple, and an ocellated purple spot on center. Caudal bright yellow green, membranes hyaline. Anal bright yellow green, with several lines of purple reticulations at base. Paired fins, hyaline. An apparently similar fish lacks cross bands, but with blackish area posterior to pectoral.
4 examples, Sirinao Island reef. December 31, 1908. Length, 44 to 65 mm.
1 example, Tara Island. December 15, 1908. Length, 35 mm.
101 examples, Tobea Island. December 15, 1909. Length, 17 to 57 mm.
21735. Tulayan Island. September 15, 1909. Length, 48 mm.
20128. Ulugan Bay, near Baheli River mouth. December 28, 1909. Length, 45 mm.
4 examples Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 18 to 31 mm.
52029 U.S.N.M. Negros. Dr. B. Dean. Length, 28 to 62 mm. 4 examples
As *Halichoeres binotopsis*.
56168 U.S.N.M. Luzon. Philippine Commission. Length, 32 to 49 mm. 3 examples.
27716 to 27718 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 45 to 53 mm.
33276 A.N.S.P. Bacon. Bureau of Fisheries. Length 36 mm.

HALICHOERES BINOTOPSIS (Bleeker)

Julis (*Halichoeres*) *binotopsis* BLEEKER, Verh. Batav. Genootsch. (Bali), vol. 22, 1849, p. 7. Boleling, North Bali.

Halichoeres binotopsis BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 120, pl. 40, fig. 1 (Java, Bawean, Bali, Timor, Ternate, Amboina, Goram).—JORDAN and SEALE, Bull Bur. Fisher., vol. 26, 1906 (1907), p. 29 (Cavite).

Platyglossus binotopsis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 153 (East Indies).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu and Manado).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 553 (Cebu).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 131 (Saonek).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 372 (Nusa Laut).

Choerojulis binotopsis MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina).

Depth 4½ in total; head, 4. D. IX, 11; A. III, 11; caudal rounded; scales in lateral line, 25.

Back reticulated with blackish violet and brownish, and with 4 or 5 darker cross bands. Head with undulated reddish violet streaks. At caudal base above black red-edged spot. Dorsal with numerous red ocelli and two black red-edged spots, first between first and second spines and second between first and third rays. Anal with yellow ocelli. Caudal orange color. Violet streak across pectoral base. (Günther.)

Known only from the East Indies. Very close to *Halichoeres leparensis*, from which it differs only in color pattern. In that species there are several dark streaks from behind the eye and the pectoral base is without a dark streak across. Reported from the Philippines by Meyer, Elera, Jordan, and Seale. Bleeker gives the dimensions 39 to 87 mm.

HALICHOERES HYRTLII (Bleeker)

Julis (*Halichoeres*) *hyrtlii* BLEEKER, Act. Soc. Sci. Ind. Néerl. (Manado), vol. 1, 1856, p. 60. Macassar.

Halichoeres hyrtlii BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 120, pl. 39, fig. 2 (Java, Singapore, Nias, Banka, Celebes, Sangi).—JORDAN and SEALE, Bull. Bur. Fisher, vol. 26, 1906 (1907), p. 29 (Manila).

Platyglossus hyrtelii GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 149 (Pinang).—REGAN, Journ. Bombay Soc. Nat. Hist., vol. 16, pt. 2, 1906, p. 330 (Persian Gulf).

Platyglossus hyrtlii PETERS, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Singapore).—DAY, Fishes of India, pt. 3, 1877, p. 398, pl. 88, fig. 1, (Malay Archipelago); Fauna British India, vol. 2, 1889, p. 405.

Platyglossus hyrtli BEAUFORT, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 131 (Waigiu).

Julis mola (part) CANTOR, Journ. Asiat. Soc. Bengal, vol. 18 (2), 1849 (1850), p. 1220. Pinang.

Julis spilurus (VAN HASSELT) BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 122 (name in synonymy).

Platyglossus bifasciatus STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 16, 1866, p. 477, pl. 5, fig. 2. Hong Kong.

Platyglossus pseudogramma CARTIER, Verh. Ges. Würzburg, vol. 5, 1874, p. 103. Ubay, Bohol.—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 552 (Ubay).

Depth 3¾ to 4⅕; head 3⅛ to 3⅕, width 2⅛ to 2¼. Snout 3⅛ to 3⅖; eye 4 to 5⅕, 1⅕ to 2 in snout, 1⅛ to greater than interorbital; maxillary reaches ¾ to 1 to eye, 4 to 4⅕ in head; interorbital 4¾ to 5½, broadly convex. Gill rakers 8 + 11, short, slender, lanceolate.

Scales in lateral line 21 or 22, 4 or 5 + 1; 4 scales above lateral line, 9 below, 10 predorsal. Scales with 23 to 25 basal radiating striae, apical 13 to 29; circuli very fine.

D. IX, 12, 1, ninth spine 2⅖ to 2⅘ in head, first ray 2⅛ to 2⅓; A. III, 11, 1 or 12, 1, third spine 3⅖ to 3¾, first ray 2½ to 2⅔; caudal 1⅓ to 1⅔; little convex behind; least depth of caudal peduncle 2⅛ to 2⅓; pectoral 1½ to 1⅔; ventral 1⅘ to 2⅕.

Back brown, below pale to whitish, with iridescent tints on sides of abdomen, and many scales of trunk and tail below each with slightly darker spot. Deep brown band from snout tip to interorbital, where forking to extend along each side of base of dorsals. Another darker or blackish brown band extends from side of snout to eye, then over postocular to middle of caudal base, where ending in small black spot at bases of upper median rays, width of band but little greater than pupil. Iris pale yellowish white. Fins all pale. Dorsals with 3 series of dull brownish reticulations and blackish median blotch at front of fin, edged whitish above and below. Blackish blotch at pectoral origin.

Persian Gulf to the East Indies and China. Bleeker's figure only differs in that it does not show a dark line or spot at the pectoral origin. We are obliged to place *Platyglossus pseudogramma* as a synonym of the present species, especially as both brown dorsal bands uniting before the dorsal without reaching snout. The species has much the appearance of the nominal *Halichoeres pyrrogrammus*, now conceded to be the female of *Halichoeres poecilopterus* (Schlegel). The last differs in one or two more branched dorsal and anal rays and dimensions of the body.

9115, 20459, 20460. Catbalogan, Samar. April 15, 1908. Length, 65 to 103 mm.
22607. Catbalogan. April 16, 1908. 8 examples. Length, 59 to 79 mm.
1 example, Cebu market. August 27, 1909. Length, 60 mm.
20900. San Miguel harbor, Ticao Island. April 21, 1908. Length, 85 mm.
19338. Sandakan Bay, Borneo. March 2, 1908. Length, 63 mm.

HALICHOERES POECILOPTERUS (Schlegel)

Julis poecilopterus Schlegel, Fauna Japonica, Poiss., pts. 7–9, 1845, p. 169, pl. 86, fig. 1. Simabara Bay.

Julis poecilopterus Richardson, Rep. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1846, p. 260 (China Seas, Canton).—Brevoort, Exp. Chin. Jap. Perry, vol. 2, 1856, p. 271 (Shimoda).

Platyglossus poecilopterus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 166 (China).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174

(Hakuri).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 554 (Luzon, Manila, Navotas).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1874, p. 28 (Japan).

Halichoeres poecilopterus Bleeker, Ned. Tijds. Dierk., vol. 2, 1865, p. 251 (Simabara Straits, Japan).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 637 (Aomori, Matsushima, Tokyo, Misaki, Wakanoura, Kobe, Onomichi, Hiroshima, Tauruga, Nagasaki).—Franz, Abhandl. K. Bayer, Akad. Wiss., vol. 4, Suppl. vol, 1, 1910, p. 53 (Yokohama and Aburatsubo).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 421 (Hakodate, Nagasaki, Oki Island, Misaki).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, 1913, p. 43 (Fusan, Korea).—Seale, Philippine Journ. Sci., vol. 9, 1914, p. 70 (Hong Kong).

Halichoeres poecilepterus Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, 1925, p. 250 (Toba, Tokyo, Misaki, Toyana, Miyazu).

Julis pyrrhogramma Schlegel, Fauna Japonica, Poiss., pts. 7–9, 1845, p. 170, pl. 86, fig. 2. Japan

Platyglossus pyrrhogramma Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 166 (copied).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Yokohama and Hakuri).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 29 (Japan).

Choerojulis pyrrhogramma Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Yeddo and Yokohama).

Julis thyrsites Richardson, Rep. Brit. Assoc. Adv. Sci. (Fish. Chin. Jap.), 1846, p. 260. Canton.

Depth 4⅗; head 3⅙, width 2⅘. Snout 3⅗; eye 4⅘, 1¼ in snout, 1⅛ in interorbital; maxillary reaches ⅘ to eye, 4⅕ in head; interorbital 4⅚, broadly convex. Gill rakers 5+10, slender, moderate, lanceolate.

Scales in lateral line 21, 6+1; 3 scales above lateral line, 8 below, 5 predorsal. Scales with 23 or 24 basal radiating striae, apical 21 to 30; circuli fine.

D. IX, 11, 1, ninth spine 3⅖ in head; first ray 3; A. III, 11, 1, third spine 4, first ray 3⅙; caudal 1⅖, slightly convex behind; least depth of caudal peduncle 2⅓; pectoral 1⅔; ventral, 2⅗.

Pale brown generally. Deep dusky brown band from side of snout across eye and head to middle of caudal base, in width little less than eye. Another dark band extends from above eye close along dorsal bases, though paler than lower band. Fins all pale to transparent and without any markings.

China, Korea, Japan. Reported from the Philippines by Elera.

16636 (Dr. 5146). Sulade Island. February 16, 1908. Length, 85 mm.
49494 U.S.N.M. Yokohama, Japan. *Albatross* collection. September, 1896. Length, 115 to 125 mm. 2 examples.
38792 U.S.N.M. Tokyo market. Department of Education. Length, 144 to 149 mm. 2 examples.
24750 A.N.S.P. Aomori, Japan. Jordan and Snyder. Length, 127 mm.
26062 A.N.S.P. Nagasaki. Jordan and Snyder. Length, 225 mm.
26274 A.N.S.P. Tsuruga. Jordan and Snyder. Length, 210 mm.

HALICHOERES AMBOINENSIS (Bleeker)

Julis (*Halichoeres*) *amboinensis* BLEEKER, Art. Soc. Ind. Néerl. (Beschr Amboin.), vol. 1, 1856, p. 55. Amboina.

Halichoeres amboinensis BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 122, pl. 37, fig. 3 (Amboina).

Platyglossus amboinensis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 156 (copied).

Depth 3½ to 3⅗; head 2⅞ to 3⅛, width 2½ to 2¾. Snout 3 to 3¼; eye 4¾ to 5, 1½ to 2 in snout, 1 to 1⅕ in interorbital; maxillary ½ to ⅗ to eye, 3⅗ to 4½ in head; single rather large posterior canine each side directed forward; interorbital 5 to 5¾, broadly convex. Gill rakers 4+10, short, lanceolate.

Scales in lateral line 22 to 25, 4 or 5+1 or 2; 3 scales above lateral line, 9 or 10 below; 9 to 12 predorsal. Scales with 26 basal radiating striae, apical 21 to 24; circuli fine.

D. IX, 12, I, ninth spine 3¼ to 3½ in head, first branched ray 2⅓ to 2½; A. II, 12, I, second spine 4⅙ to 4½, first branched ray 2½ to 2⅞; caudal 1⅓ to 1⅔, little convex behind; least depth of caudal peduncle 2 to 2⅓; pectoral 1½ to 1¾; ventral 1⅓ to 2⅛.

Dull brownish generally, paler to whitish on under surface. Each scale on body with faintly darker spot basally. Head with 4 or 5 longitudinal grayish bands, of which 2 extending back from hind eye edge. Dorsals and anals each with faint traces of numerous whitish oblique lines and blackish blotch on first 2 membrances of spinous dorsal medially. Fins otherwise uniformly pale. Pectoral with narrowly cuneate basal blackish blotch.

Known previously only from a single example described from Amboina by Bleeker, 136 mm. long. He gives the pectoral rays as II, 13, but most of our examples show II, 12, and only one has II, 13. Our examples also differ a little in that the pale lines on the spinous dorsal are oblque like those on the soft dorsal. Also our examples have the anterior black blotch on the spinous dorsal median and not basal.

21470. Doworra Island. December 2, 1909. Length, 93 mm.

12695. Gondra Island, near Bolipongpong Island. September 20, 1909. Length, 72 mm. [1974]. Slaty-gray. Dorsal with pale reticulating lines. Anal similar. Caudal pale orange; black speck in upper base, no distinct bars; black spot at upper base of pectoral. Vinaceous stripes on side of head.

21574. Port Galera. October 27, 1909. Length, 80 mm.

16273, 16490, 16491. Teomabal Island. September 18, 1909. Length, 95 to 103 mm.

HALICHOERES TENUISPINIS (Günther)

Platyglossus tenuispinis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 161. Seas of China.—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Nagasaki and Yokohama).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 553 (Luzon, Cavite, Santa Cruz).

Halichoeres tenuispinis BLEEKER, Nat. Tijds. Dierk., vol. 2, 1865, p. (56) 57 (Amoy).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, 1925, p. 250 (Tokyo, Shizuoka, Misaki, Toyana).

Platyglossus bleekeri STEINDACHNER and DÖDERLEIN, Denks. Akad. Wiss. Wien, vol. 53 (1), 1887, p. 275. Tokyo.

Halichoeres bleekeri JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 138 (Tokyo, Misaki, Kobe, Onomichi, Hiroshima, Nagasaki).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 421 (Tokyo).—JORDAN and METZ, Mem. Carnegie Mus., vol. 6, No. 1, 1913, p. 43 (Fusan, Korea).

Depth 3 to 3½; head 3 to 3⅙, width 2 to 2⅗. Snout 2⅞ to 3⅕; eye 4⅓ to 6¼, 1½ to 2⅛ in snout, 1 to 1⅔ in interorbital; maxillary reaches ⅗ to ¾ to eye, 4 to 5 in head; interorbital 4¼ to 4⅞, convex. Gill rakers 6+11, lanceolate, short. Scales in lateral line 21, 5+1; 3 scales above lateral line, 8 or 9 below, 11 predorsal. Scales with 19 to 25 basal radiating striae; apical, 30 to 31 with 12 or more auxiliaries; circuli fine.

D. IX, 12, 1, ninth spine 3 to 4⅓ in head, first ray 2⅖ to 2⅔; A. III, 12, 1, third spine 3⅛ to 4½, first ray 2⅗ to 2⅔; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2 to 2¼; pectoral 1⅝ to 1⅞; ventral, $1\frac{1}{10}$ to 2.

Brown generally, paler to whitish below. Back with 7 obscure deep saddles, separated by narrow interspaces. About 5 or 6 longitudinal bluish bands, upper 4 much closer and distinct usually only anteriorly, lower as series of short vertical bars. On head blue bands form as 1 at tip of snout rather broadly to eye, then as more or less divided postocular band. Also narrower bluish band across cheek horizontally toward pectoral base. Iris yellowish. Dorsals and anals gray blue, especially basally; black spot at first and second dorsal membranes medially; dorsals with median row of basal buff spots and smaller outer series more irregular and crowded. Anals with basal row of buff spots and median longitudinal buff band; brown median line and narrow brown submarginal line. Caudal buff, with transverse gray cross-lines, variable and each margined with darker. Paired fins uniform buff, with deep neutral blue black spot at axil size of pupil.

Philippines, China, Korea, Japan. Related to *Halichoeres amboinensis* in the blue bands on the head and dark spot at the front of spinous dorsal, but the dorsals and anals spotted and the black spot at pectoral origin only.

8232 to 8241, 8243 to 8246, 13009. Catbalogan, Samar. April 15, 1908. Length, 73 to 138 mm.

1 example, Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 88 mm.

8 examples, North end of Endeavor Strait, northwest coast of Palawan. December 22, 1908.

13805. Pujada Bay, Mindanao. May 15, 1908. Length, 130 mm.

3 examples, Ragay Bay, Ragay Gulf, Luzon. March 10, 1909. [1288.] Length, 44 to 63 mm. Body and top of head emerald; numerous orange spots above middle of side; on head orange stripes and spots; vinaceous brown stripe from

snout to front of eye, bordered by pale blue, continued brokenly behind, showing on opercle as four bars, lower with broad bluish border below; nuchal region irregularly spotted, on back two rows under dorsal fin, spots apparently occupy center of scales; under lateral line row of irregular dots, below two rows, some short vertical bars; dusky area above short limb of lateral line, lower head sulphur yellow; vinaceous stripe from below middle of eye obliquely backward toward lower base of pectoral, not reaching beyond opercular margin, upward along margin to above base of pectoral, bordered either side by bluish line; behind pectoral base two rows of red spots, lower oblong and transversely placed anteriorly; belly whitish with more or less blue shade posteriorly; pale green above anal. Dorsal yellowish green, much striped with red; near base red arches across each membrane to base of spines and rays, second bar not so distinctly arched, becoming almost straight oblique lines on soft membranes; third marginal bar on spinous portion, becoming inframarginal to hyaline tips on soft portion. Caudal pink. Anal similar to dorsal, but paler, second red bar joining third, forming broad band. Paired fins pale, pectorals lemon yellow at base, with blue spot in upper edge and dash of reddish in front.

1 example, Ulugan Bay, near Baheli River mouth. December 28, 1908. Length, 85 mm.

20634. Kowloon market, China. September 26, 1908. Length, 113 mm.

49869 U.S.N.M. Yokohama. A. Owston. Length, 127 mm. 1 example.

50245 U.S.N.M. Kobe, Settsu. Jordan and Snyder. Length, 107 to 127 mm. 5 examples.

51809 U.S.N.M. Japan. Dr. E. A. Mearns. Length, 110 to 133 mm. 2 examples.

71575 U.S.N.M. Tokyo market. *Albatross* collection. Length, 157 mm. 1 example.

HALICHOERES PROSOPEION (Bleeker)

Julis (*Halichoeres*) *prosopeion* BLEEKER, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 347. Amboina; Act. Soc. Ind. Néerl., vol. 6 (No. 2), 1859, p. 3 (Doreh, New Guinea).

Halichoeres prosopeion BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 122, pl. 37, fig. 2 (Amboina).

Platyglossus prosopeion GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 155 (Amboina).

Depth 3⅙ to 3⅕; head 3⅛ to 3⅓, width 2⅓ to 2½. Snout 3 to 3⅓; eye 4⅓ to 4⅞, 1⅓ to 1½ in snout, 1 to 1¼ in interorbital; maxillary reaches ⅔ to eye, 4⅖ to 4⅔ in head; interorbital 4 to 4¼, convex. Gill rakers 4+8, lanceolate, short.

Scales in lateral line 21 or 22, 5+1; 5 scales above lateral line, 10 below, 9 to 12 predorsal. Scales with 22 to 26 basal radiating striae, apical 24 to 27; circuli very fine.

D. IX, 12, 1, third spine 3⅞ to 4 in head, first ray 2⅔ to 2¾; caudal 1⅕ to 1¼, convex behind; least depth of caudal peduncle 2 to 2$\frac{1}{10}$; pectoral 1⅖ to 1½; ventral 1⅕ to 1¼.

Brown generally; head and anterior portion of body all smoky or dusky brown. Scales on back posteriorly show traces of slightly deeper brown basal spot. Iris neutral brown. Small neutral dusky postocular spot, not larger than pupil and another larger at pectoral

origin. Dorsals largely pale brown, with very fine longitudinal brown lines, variously incomplete or broken as spots, dots or bars and not extending on anterior half of spinous dorsal, which neutral brown of deep shade; round large black blotch on second and third membranes of spinous dorsal. Anals pale like soft dorsal, with 4 complete longitudinal brown lines, outermost marginal. Caudal uniformly pale yellowish-brown. Paired fins gray brown, ventrals little deeper.

Known only from the East Indies. Our examples differ slightly from Bleeker's figure in the somewhat dark postocular blotch.

13361. Sablayan, Mindoro. December 12, 1908. Length, 98 mm.
19191. Tulnalutan Island. September 9, 1909. Length, 123 mm. [1917.]

HALICHOERES HARTZFELDII (Bleeker)

Julis (*Halichoeres*) *hartzfeldii* BLEEKER, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 563. Amboina.

Halichoeres hartzfeldi BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 123, pl. 35, fig. 4 (Bali, Celebes, Ternate, Buru, Amboina).

Platyglossus hartzfeldii GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 157 (East Indies).

Choerojulis hartzfeldi MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Larentuka, Flores).

Halichoeres hartzfeldii FOWLER, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 537 (Padang, Sumatra).

Depth 3⅘ to 3⅞; head 3 to 3⅛; width 2⅕ to 2⅔. Snout 2$\frac{9}{10}$ to 3⅕; eye 5⅓ to 6⅖, 1¾ to 2⅓ in snout, 1⅕ to 1½ in interorbital; maxillary reaches ⅘ to ⅞ to eye, 3⅖ to 3⅘ in head; interorbital 4½, convexly elevated. Gill rakers 7+13, lanceolate.

Scales in lateral line 20 or 21, 5 or 6+1; 4 or 5 scales above lateral line, 9 or 10 below, 15 predorsal; scales on breast, predorsal and caudal base small. Scales with 41 to 43 basal striae, apical 28 to 34 obsolete; circuli fine.

D. VII to IX, 10, 1 or 11, 1, third spine 3⅔ to 4½ in head, first ray 2⅖ to 3⅛; A. III, 10, 1 or 11, 1, third spine 4 to 4⅔, first ray 2⅘ to 2⅞; caudal 1⅔ to 1⅞, truncate, convex behind; least depth of caudal peduncle 2⅗ to 2⅘; pectoral 1½ to 1⅔; ventral 2 to 2⅛.

Body pale brown generally, little lighter below. Gray band from side of snout tip to eye, then postocular across opercle above and continued broadly along side of belly to caudal base; its lower edge above anal front with 2 or 3 short extensions downward. Gray band crosses mandible at end of maxillary and extends to eye below. Gray blotch at articulation of mandible and another on lower part of opercle on side of head below. Gray band obliquely down from before pectoral origin toward vent. Iris yellowish. Dorsals pale brown, with narrow grayish median and submarginal parallel bands and row of grayish basal spots. Anals pale brown, basal half broadly grayish and median pale narrow longitudinal band, with narrow

darker bordering lines. Caudal pale, with several obscure broken transverse bands. Paired fins uniformly pale, small black spot at pectoral origin.

East Indies.

5575 and 5576. Jolo market, Jolo. February 11, 1908. Length, 127 to 138 mm.

11916. Jolo market. Length, 167 mm. [75.] Greenish olive, most distinct as stripe above axis; through axial region from tip of opercle on to caudal broad stripe of salmon, narrowly bordered bluish purple above and irregularly so at hinder part below, salmon color breaking through in vertical dashes on side, which otherwise brassy yellow, becoming hyaline with lavender shades and blue below; on back outer half of scales geranium red; color running on to base of dorsal and involving its lower half; top of head light green, with dashes of red, this covering most of occiput except narrow purple line in front of fin; red forming inverted U on interorbital, limb continues into short stripe across preocular; area behind eye to above opercle, of red, continuing forward as narrow line under eye and broadening to stripe crossing preocular and mandible; another stripe parallel to this across mandible to lower edge of cheek, continuing on lower edge of subopercle; dash of same color from angle of preopercle, and another across edge of opercle above, occurring again on edge of opercular flap, extreme tip of latter hyaline. Sulphur yellow spot above base of pectoral under opercle; oblique bar of red before pectoral base, fading out on abdominal region. Ground green color appears at series of spots at base of dorsal, first becoming distinct under last spines and bluish toward posterior end of soft dorsal; fin edge very pale pink with purplish hyaline bar immediately below; median yellow bar width of pupil across entire fin, purplish hyaline again between former and red of basal half of fin. Caudal greenish, becomes yellowish toward terminal part; upper edge red, continued from top of caudal peduncle and double irregular red bar through middle, color again occurs as lenticular margin at tip. Anal base red, followed by purplish hyaline yellow through center and broadly margined pinkish. Ventral pinkish hyaline, base dusky purplish. Pectoral same, black spot at base.

27719 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 185 mm.

HALICHOERES ARGUS (Schneider)

Labrus argus Schneider Syst. Ich. Bloch, 1801, p. 263. Australia. (?Walbaum, Arted. Pisc., ed. 2, vol. 3, 1792, p. 261. No locality.)

Julis argus Bennett, Zool. Journ., vol. 3, 1828. p. 577 (Sumatra).

Halichoeres argus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 787 (Negros); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 30 (Cavite).

Labrus guttatus (not Bonnaterre, 1788) Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 149, pl. 287, fig. 2. (Locality unknown.)

Halichoeres guttatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 124, pl. 35, fig. 1 (Java, Bawean, Sumatra, Nias, Batu, Lepar, Biliton, Celebes, Sangi, Buru, Amboina, Ceram).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).

Platyglossus guttatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 155 (Sumatra, Ceram, Chusan).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Macleay, Proc. Linn. Soc., New South Wales, vol. 8, 1883, p. 274 (New Guinea).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu and Sangi).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 553 (Luzon, Manila, Cebu, C. de Samar).—Günther,

Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 270 (Ovalau).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 373, fig. 75, figs. *a* and *b* (Siau Island).

Julis (*Halichoeres*) *polyophthalmus* Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 731. Lepar Island; Cauer, West Sumatra.

Julis perlatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 124. (Name in synonymy.)

Platyglossus guttulatus Macleay, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 587. New Guinea.

Halichoeres leparensis (not Bleeker) Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Depth 3 to 3⅓; head 3 to 3⅛, width 2½ to 2⅔. Snout 3 to 3¼; eye 5 to 5⅖, 1¾ to 2 in snout, 1 to 1⅙ in interorbital; maxillary reaches ¾ to eye, 4 in head; interorbital 4⅘ to 5⅓, convex. Gill rakers 4+11, short, lanceolate.

Scales in lateral line 22 or 23, 3 or 4+2; 4 scales above lateral line, 9 below, 10 predorsal. Scales with 23 to 31 basal radiating striae, apical 27 to 30; circuli fine.

D. IX, 12, 1, ninth spine 2½ to 2⅞ in head, first branched ray 2⅛ to 3⅙; A. III, 12, 1, third spine 3⅖ to 3½, first branched ray 2¼ to 2½; caudal 1¼ to 1⅓, convex behind; least depth of caudal peduncle 2 to 2⅖; pectoral 1⅗ to 1⅔; ventral 1½ to 1⅞.

Body brownish generally, under surface pale. Each scale with large pale terminal spot about size of pupil, resulting dark area above and below formed as horizontal longitudinal heliotrope purple bands. Head with several heliotrope purple bands, more or less horizontal and short one close behind eye neutral black. Dorsals and anals grayish, spotted with brownish and margins narrowly pale. Caudal whitish, with traces of crowded brownish spots and terminally dusky. Paired fins pale, uniform. Ventral slightly yellowish. No dark blotch at pectoral base, either in axil or externally.

East Indies, Philippines, Chusan, Ovalau. Bleeker's figure shows the pectoral dark terminally and 5 pale blotches along the back above the lateral line.

1 example, Batan tide pool. June 5, 1909. Length, 33 mm.

9 examples, Batan Island. July 22, 1909. Length, 24 to 42 mm.

1419. Cebu market. March 20, 1909. Length, 23 mm. Dark green, centers of each scale below lateral line with red-centered black-rimmed ocellus; olive-yellow interpolated posteriorly; breast and belly paler; triangular blotch of greenish on cheek, another on opercle, each edged blue and black, vinaceous within; vinaceous stripe along interopercle, edged with blue; preorbitals with vinaceous stripe. Dorsal with double row of round red-centered, blue and black rimmed ocelli, fuse anteriorly in second row; tips of rays and membranes hyaline; on soft portion double row of red dots between these and ocelli; no black blotch. Caudal yellow at corners and in base, centrally on tip blackish; body of fin with reticulations of orange or scarlet. Anal similar to dorsal. Paired fins plain, except a reddish stripe in front of ventral.

5 examples, Cebu market. March 22, 1909. Length, 83 to 94 mm.

5096 and 5097. Cebu market. April 5, 1908. Length, 71 to 73 mm.
6086 and 6088. Cebu market. August 12, 1909. Length, 105 to 109 mm.
4 examples, Cebu market. September 3, 1909. Length, 92 to 110 mm.
21107. Danawan Island and Si Amil Island. September 27, 1909. Length, 91 mm.
1 example, El Lagan Psug, near mouth of Baheli River. December 28, 1908. Length, 68 mm.
20439. Grande Island reef. June 8, 1908. Length, 65 mm.
3 examples, Nogas Point, Panay. February 4, 1908. Length, 52 to 70 mm.
1 example, Port Matalvi, Luzon Island. November 13, 1908. Length, 64 mm.
1 example, Port Palapag. June 3, 1909. Length, 40 mm.
12 examples, Sablayan, Mindoro. December 13, 1908. Length, 37 to 80 mm.
52022 U.S.N.M. Negros. Dr. B. Dean. Length, 76 mm. 1 example.
56245 U.S.N.M. Bacon. Philippine Commission. Length, 65 mm. 1 example.
27720 and 27721 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 58 to 70.
48744 to 48751 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 50 to 62 mm. As *Halichoeres leparensis*.

HALICHOERES CHLOROPTERUS (Bloch)

Labrus chloropterus Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 151, pl. 288. Japan.—Forster, Fauna Indica, 1795, p. 15.

Halichoeres chloropterus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 125, pl. 35, fig. 3 (Java, Bawean, Duizend Islands, Singapore, Banka, Celebes, Amboina).—Bleeker, Ned. Tijds. Dierk., vol. 4, 1874, p. 117 (China).

Platyglossus chloropterus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, pp. 144, 507 (East Indies).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (North Celebes).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 131 (Saonek).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 370 (Macassar).

Julis semi-decorata Lesson, Mem. Soc. Hist. Nat. Paris, vol. 4, 1828, p. 403. Mauritius; Voy. Coquille, Zool., vol. 2 (1), 1830, p. 138, pl. 35, fig. 2 (type).

Julis (*Halichoeres*) *cuvieri* (not Bennett) Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 24.

Halichoeres bleekeri Günther, Ann. Mag. Nat. Hist. London, ser. 3, vol. 8, 1861, p. 386 (on *Julis* (*Halichoeres*) *cuvieri* Bleeker).

Depth 2⅗ to 3⅕; head 3 to 3¼, width 2 to 2⅓. Snout 2½ to 2¾; eye 5⅞ to 6⅓, 2½ in snout, 1⅗ to 1¾ in interorbital; maxillary 3⅘ to 4⅙, in head, reaches ½ to ⅗ to eye; interorbital 3¾ to 4½ in head, convex. Gill rakers 7+11, short, lanceolate.

Scales in lateral line 21 or 22, 5 or 6+2; 5 or 6 scales above lateral line, 10 below, 10 to 15 predorsal. Scales with 23 to 45 basal striae, apical 30 to 39; circuli very fine.

D. IX, 11, 1, ninth spine 3 to 3¼ in head, first ray 2¼ to 2⅓; A. II or III, 11, 1, third spine 3⅞ to 4, first ray 2⅗ to 2⅘; caudal 1⅗ to 1½, truncate; least depth of caudal peduncle 1⅘ to 2; pectoral 1⅗ to 1⅔; ventral 1½ to 1⅞.

Head and trunk to tail largely pale blue to caerulean blue; side of former with variable buff blotches, usually 5 or 6 on lower half of same. Each scale on trunk far as opposite vent with round pale buff spot. On side of chest pale blue vermiculations leave buff interspaces and usually oblique buff band down obliquely from pectoral axil till behind ventral base. Tail uniform pale brown. Iris yellowish. Dorsals grayish, with basal and terminal marginal buff longitudinal bands; on soft fin outer half buff with gray lines or vermiculations and basally neutral gray to bluish with oblique buff bars. Anals grayish, with median buff longitudinal band, and small buff spot at base of each ray. Caudal pale buff, with traces of 4 or 5 transverse lines. Paired fins buff, oblique neutral gray band across pectoral base.

Mauritius, Malacca, East Indies, China. Though originally ascribed to Japan its occurrence there is ignored by later writers. It is one of the larger species, with the anterior half of the body spotted and the coloration handsome.

15980. Busin Harbor, Burias Island. April 22, 1908. Length, 159 mm.
11691, 16192. Cataingan Bay, Masbate. April 18, 1908. Length, 150 to 154 mm.
13023 and 13168. Cataingan Bay. April 17, 1908. Length, 128 to 165 mm.
7594. Catbalogan, Samar. April 14, 1908. Length, 190 mm.
8247 and 8248. Catbalogan. April 15, 1908. Length, 174 to 185 mm.
1 example, Catbalogan. April 16, 1908. Length, 160 mm.
5111. Cebu market. April 5, 1908. Length, 163 mm.
7577. Cebu market. April 6, 1908. Length 165 mm.
7841. Cebu market. April 7, 1908. Length, 160 mm.
14182. Cebu market. September 2, 1909. Length, 139 mm.
145 and 10827. Langao Point, Luzon. June 24, 1909. Length, 178 to 180 mm.
21097. Maculabo Island. June 14, 1909. Length, 145 mm. [1645.]
16919 and 16921. Makesi Island, Palawan. April 5, 1909. Length, 119 to 138 mm.
1 example, Romblon. March 26, 1908. Length, 127 mm.
11714. Santa Cruz, Marinduque. April 24, 1908. Length, 165 mm.
9399. Surigao, Mindanao. May 8, 1908. Length, 142 mm.
12902. Tobea Island. December 14, 1909. Length, 139 mm.
236. Ulugan Bay, Palawan. December 29, 1908. Length, 160 mm. [988.] Back grass green; top of head smoky purplish; purple shades on side of head and about pectoral fin; body pale green above anal fin; scales of posterior portion of back peppered with black dots in purplish center; head with broad stripes and spots of greenish, continued on lower side under pectoral. Dorsal grass green, with brownish marginal bar on spinous portion, continued as yellow inframarginal bar on soft fin; basal half of fin with broad purplish reticulation. Caudal rays green, membranes hyaline, few purplish specks on rays. Anal hyaline smoky purple with green central bar. Ventrals very pale greenish. Pectorals same, membranes of both hyaline; pectoral yellowish green at base, black bar across; axil yellowish green. Lower head pale green. Iris with scarlet.
13074 to 13076, 13237. Macassar market, Macassar, Celebes, Dutch East Indies. December 24, 1909. Length, 131 to 160 mm.

HALICHOERES GYMNOCEPHALUS (Schneider)

Labrus gymnocephalus Schneider, Syst. Ichth. Bloch, 1801, p. 251. No locality.

Platyglossus gymnocephalus Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 270 (Singapore).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 271 (East Indies, Pelew Islands).

Halichoeres gymnocephalus Jordan and Richardson, Bull. Bur. Fish., vol. 27, 1908, p. 266 (Cuyo).

Julis (*Halichoeres*) *modestus* Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 26. Batavia, Java.

Halichoeres modestus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 126, pl. 35, fig. 2 (Java, Bawean, Duizend Islands, Singapore, Banka, Lepar, Biliton, Sumbawa, Buru, Timor).

Platyglossus modestus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 57 (Singapore).—Károli, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 174 (Singapore).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (Mysore).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island).

Depth 3 to 3½; head 3, width 2⅙ to 2⅖. Snout 2¾ to 3; eye 5 to 6⅖, 1⅞ to 2⅕ in snout, 1 to 1⅔ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3¾ to 4¼ in head; interorbital 4 to 4½, convex. Gill rakers 5+6, lanceolate, rather robust and short.

Scales in lateral line 22, 5+1; 5 scales above lateral line, 10 below, 12 predorsal. Scales with 23 to 30 basal radiating striae, apical 28; circuli fine.

D. IX, 11, 1, ninth spine 2¾ to 3 in head, first ray 2⅓ to 2½; A. III, 11, 1, third spine 2⅞ to 4, first ray 2⅖ to 2½; caudal 1¼ to 1⅓, truncate, convex as expanded; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅗ to 1⅚; ventral 1⅔ to 2⅛.

Brown generally, little paler below. Back, omitting predorsal, including most all of caudal peduncle and caudal base, with fine dusky to blackish dots, some even extending on bases of dorsals and caudal. Blue band from end of snout to eye, another across postocular and still lower one variously distinct or connected, across cheek longitudinally. Iris pale yellowish. Large neutral dusky or neutral brown blotch, imperfectly defined, on side of body at or behind depressed pectoral. In some examples lateral dark blotch may be indistinct or even absent. Fins all largely pale to transparent. Blackish bar transversely across pectoral at base.

East Indies and Micronesia. Well distinguished by the large dark costal blotch and the minute dark dots on the back.

5 examples, Bolalo Bay, Palawan. December 21, 1908. Length, 75 to 96 mm.
18472. Bolalo Bay, Palawan. December 21, 1908. Length, 104 mm.
13167, 13169, 13170. Cataingan Bay, Masbate. April 17, 1908. Length, 65 to 108 mm. 8 examples.
16857 to 16859. Cataingan Bay. April 18, 1908. Length, 99 to 101 mm.
10698. Cataingan Bay. April 19, 1908. Length, 91 mm.

1 example, Cataingan Bay, Dumurug Point, Masbate. April 19, 1908. Length, 104 mm.
16092. Cataingan Bay. May 14, 1909. Length, 98 mm.
7591 and 7592. Catbalogan, Samar. April 14, 1908. Length, 141 to 143 mm.
8242 and 13010. Catbalogan. April 15, 1908. Length, 116 to 145 mm.
5 examples, Catbalogan. April 16, 1908. Length, 94 to 131 mm.
19123. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 105 mm.
15735. Endeavor Strait, northwest coast of Palawan. December 23, 1908. Length, 99 mm.
14098 and 14099. Endeavor Strait. December 24, 1908. Length, 83 to 113 mm.
31 examples, Great Tobea Island. December 15, 1909. Length, 30 to 107 mm.
1 example, Jolo market. March 6 to 7, 1908. Length, 96 mm.
143. Langao Point, Luzon. June 24, 1909. Length, 114 mm.
2 examples, Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 70 to 85 mm.
2 examples, Malcochin Harbor. December 19, 1908. Length, 46 to 61 mm.
6715. Mansalay, Mindoro. June 4, 1908. Length, 116 mm.
15961 and 15962. Masbate reef. April 20, 1908. Length, 85 to 93 mm.
1 example, north end of Palawan, Endeavor Strait, northwest coast. December 22, 1908.
22705. Port Caltom. December 15, 1908. Length, 49 to 118 mm. 6 examples.
4 examples, Ragay Bay, Ragay Gulf. March 10, 1909. Length, 54 to 60 mm.
18647 to 18649. Ragay Gulf. March 10, 1909. Length, 89 to 100 mm.
18879. Tilig, Lubang. July 15, 1908. Length, 128 mm.
4 examples, Tobea Island. December 15, 1909. Length, 44 to 73 mm.
20129. Ulugan Bay, near Baheli River mouth. December 28, 1908. Length, 74 mm.
235. Ulugan Bay, Palawan. December 29, 1908. Length, 110 mm.
1 example, Gane Road, Gillolo Island, Moluccas, Dutch East Indies. December 1, 1909. Length, 94 mm.
72277 U.S.N.M. Cuyo, Philippines. R. C. McGregor. Length, 75 mm.

HALICHOERES PODOSTIGMA (Bleeker)

Julis (*Halichoeres*) *podostigma* Bleeker, Nat. Tijds. Ned. Indie, vol. 6, 1864, p. 332. Larantuka, Flores.

Halichoeres podostigma Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 126, pl. 32, fig. 4 (Amboina, Buru, Flores).

Platyglossus podostigma Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 160 (East Indies).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (North Celebes).

Depth 2½ to 3⅓; head 3⅙ to 3¼, width 2⅕ to 2½. Snout 2⅗ to 3; eye 4½ to 6⅕, 1½ to 2¼ in snout, 1 to 1⅗ in interorbital; maxillary reaches ½ to ⅔ to eye, 3⅞ to 4⅙ in head; interorbital 4⅛ to 5, convex. Gill rakers 7+8, lanceolate, short.

Scales in lateral line 22, 4+2; 4 scales above lateral line, 10 below, 10 or 11 predorsal. Scales with 35 to 44 basal radiating striae, apical 29 to 48; circuli fine.

D. IX, 12, 1, ninth spine 3¼ to 3½ in head, first ray 2⅔ to 2¾; A. III, 12, 1, third spine 3½ to 4⅛, first ray 2⅗ to 2⅔; caudal 1¼ to 1½, slightly convex behind; least depth of caudal peduncle 1⅗ to $2\frac{1}{10}$; pectoral 1⅓ to 1⅗; ventral $1\frac{1}{10}$ to 1⅞.

Head, breast, belly, caudal and posterior portion of caudal peduncle pale brown, rest of trunk and tail dark brown, base of each scale with dusky blotch. Gray streak from maxillary to eye and 2 from behind eye. Several grayish blotches on cheek and opercle. Dorsals and anals pale brown with neutral slaty reticulations; margin of dorsals pale, with 2 close-set, dark lines and anals with 4. Paired fins pale brownish, with small blackish ocellus at pectoral origin.

East Indies, Philippines.

5339. Cebu market. April 4, 1908. Length, 157 mm.

11787. Cebu market. November 20, 1909. Length 162 mm. [1428.] Purple and dark olive, shading to bluish on lower body, vinaceous markings, nape yellowish; bright orange above pectoral base, base itself with black spot; tip of peduncle and caudal fin paler. Dorsal and anal with reddish ground and olive centered blue-rimmed ocellate lines and spots. Caudal with slight clouding of similar blotches. Paired fins without marks.

12690. Gondra Island, near Bolipongpong Island. September 20, 1909. Length, 135 mm. [1973.] Scales of side with violet black vertical bar, placed in elliptical dark green or purplish spot; margin of scales somewhat reddish in middle of side; nape pale olive, becoming greenish under front of dorsal; side of head pale greenish, with very pale vinaceous markings; lower side and chin bluish; breast and front of abdomen with lavender wash. Dorsal with narrow inframarginal line bounded by black, oblique downward and backward bars of purple on main body of fin. Caudal and its base pale. Anal similar to dorsal but inframarginal line much broader and broken by hyaline areas, giving reticulated form. Ventrals hyaline with blackish bar through center. Pectorals dusky hyaline; black bar on exterior of axil and black blotch at upper base outside.

1 example, Jolo. Length, 62 mm.

8831 and 8834. Mahinog, Camiguin Island. August 3, 1909. Length, 82 to 120 mm.

21845. Pandanon Island. March 23, 1909. Length, 132 mm.

6694. Singaan Island. September 21, 1909. Length, 138 mm.

19225. Tapiantana Island. September 13, 1909. Length, 124 mm. [1920.] Top of head green, becoming olivaceous on nape; lips and side of head pale green with vinaceous stripes and markings; stripe across preorbital more or less olive; scales of side with violet black centers and ochry olive edges, probably bright green in life; breast and belly rusty greenish; black spot behind point of opercle with orange between it and flap, black outlined by narrow blue line; similar black spot on upper edge of pectoral base; axil of pectoral black exteriorly. Dorsal olive, with dusky vinaceous reticulating lines, inframarginal bar of same color; soft tips of rays, as well as spines hyaline. Caudal pale greenish, base of fin and posterior peduncle paler, rays with reddish shade at bases. Anal with green oblique blotch at base of each membrane, divided by purplish or vinaceous olive reticulating bar from pale green central bar; distal ⅔ of fin with purplish shade and numerous irregular bluish spots; narrow blue lines define each of areas. Ventrals very pale green, with dash of reddish through center and on second membrane. Pectoral dusky, bright green at base.

21122. Cape Kait, Libani Bay, Celebes. December 29, 1909. Length, 143 mm.

HALICHOERES LEUCOSTIGMA, new species

Depth 3; head 3⅙, width, 2¼. Snout 3; eye 5⅔; maxillary reaches half way to eye, 4¼ in head; interorbital 5, convex. Gill rakers 8+10, short, flexible.

Scales in lateral line 22, 5+1; 3 scales above lateral line, 9 below, 11 predorsal. Scales with 25 basal radiating striae, apical 32 or 33; circuli very fine.

D. IX, 12, 1, spines pungent, ninth spine 3 in head, first ray 2$\frac{1}{10}$; A. III, 12, 1, third spine 3¾, first ray 2⅓; caudal convex behind, 1⅔; least depth of caudal peduncle 2; pectoral 1⅔; ventral 1$\frac{9}{10}$.

Body and head brown generally, little paler below or on abdomen. Along median axis of tail 4 rounded whitish spots, first opposite vent below lateral line, also second and third below lateral line and fourth mostly above lateral line but behind bend. Traces of some purplish brown blotches on upper part of head, especially one as band each side of snout. Fins all dull brown, anal and ventral more or less whitish. Dorsals show traces of 3 or 4 longitudinal rows of pale rounded spots. Pectoral with small neutral dusky triangular blotch at origin. Iris pale or yellowish brown.

Only the type known, a single example 13805. Pujada Bay, Mindanao. May 15, 1908. Obtained by dynamite. Length, 130 mm. It is unique among all the species of the genus we have examined in the 4 white spots along the median axis of the tail.

Type.—Cat. No. 89974, U.S.N.M.

(Λευκὸς, white; στίγμα, spot; with reference to the white spots along the side of the tail.)

Genus MACROPHARYNGODON Bleeker

Macropharyngodon Bleeker, Proc. Zool. Soc. London (December 10), 1861 p. 412. Type *Julis geoffroy* Quoy and Gaimard, orthotypic.

Body compressed, short, deep. Head compressed, rather deep. Anterior canines $\frac{4}{4}$, second of each side above turned back; 1 hind canine above near mouth angle, sometimes duplicated. Scales 28 in lateral line. Head naked, also nape; scales on breast very small. Lateral line continuous. Dorsal spines 9, rays 11. Anal spines 3, rays 11. Caudal truncate or rounded.

East Indies and Oceania. Small and very brilliant coral reef fishes. Differs from *Halichoeres* in the deeper body and but few large pharyngeal teeth.

MACROPHARYNGODON GEOFFROY (Quoy and Gaimard)

Julis geoffroy Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 270, pl. 56, fig. 3. Hawaiian Islands.

Julis geoffroyi Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 479 (type).

Macropharyngodon geoffroyi Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 129, pl. 37, fig. 5 (Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 145 (Hawaii, Ulea, or Celebes?); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 261, pl. 143, fig. 3 (Hawaiian Islands).

Macropharyngodon geoffroy JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 288, fig. 124 (Honolulu).

Platyglossus geoffroyii WEBER, Abbandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Islands).

Julis meleagris VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 481. Ulea.—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 376 (Elat).

Marcropharyngodon aquilolo JENKINS, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 46, fig. 1. Honolulu.

Depth 2⅞ to 3; head 3⅛ to 3⅓, width 2¼ to 2⅓. Snout 3 to 3½; eye 5 to 5½, 1⅔ to 1¾ in snout, 1⅕ to 1⅖ in interorbital; maxillary reaches ¾ to eye, 3¾ to 4⅙ in head; interorbital 4 to 4⅛, convex. Gill rakers 6+11, short, lanceolate.

Scales in lateral line 22, 5+1; 4 scales above lateral line, 10 below, 5 or 6 predorsal. Scales with 32 to 41 basal radiating striae; apical 33 to 45; circuli fine.

D. IX, 11, 1, ninth spine 2⅔ to 3$\frac{1}{10}$ in head, first ray 2⅛ to 2½; A. III, 11, 1, third spine 3¼ to 4, first ray 2¼ to 2⅔; caudal 1⅛ to 1¼, truncate; least depth of caudal peduncle 1⅔ to 2; pectoral 1¼ to 1½; ventral 1⅗ to 1⅔.

Purplish brown, each scale with pale spot. Blackish scale, with white spot, at humeral region. Head bluish, with brown spots and blotches, margined with neutral. Iris pale yellowish. Vertical fins gray, with brown spots and blotches; on caudal as about 6 transverse rows, upper and lower edges gray. Paired fins, uniform pale brown.

East Indies, Micronesia, Hawaii. The examples below, the first from the Philippines.

8840. Mahinog, Camiguin Island. August 3, 1909. Length, 144 mm.
6419. Sulade Island. September 17, 1909. Length, 134 mm.
16036. Sulade Island. September 18, 1909. Length, 112 mm.
51142 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 103 mm.
52304 U.S.N.M. Apia. Bureau of Fisheries. Length, 115 mm.
9622 and 9623 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 132 mm.
17196 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 100 mm.

Genus LEPTOJULIS Bleeker

Leptojulis BLEEKER, Proc. Zool. Soc. London (December 10), 1861, p. 412. Type *Julis* (*Halichoeres*) *cyanopleura* BLEEKER, monotypic.

Body compressed, slender. Anterior canines 4 in each jaw, outer enlarged, bent outwards and backwards; posterior canine present. Scales on thorax smaller than those on body. Head naked. Body scales moderate, less than 30 in lateral line. Lateral line continuous. Dorsal spines 9, rays 11. Anal spines 3, rays 11.

East Indies and Oceania.

LEPTOJULIS PARDALIS Kner

Leptojulis pardalis Kner, Sitz. Akad. Wiss. Wien, vol. 56, 1867, p. 728, pl. 3, fig. 2 (9 in text). Viti Islands, Fiji.—Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 298, pl. 45, fig. 3 (Apia, Samoa).

Platyglossus pardalis Günther, Journ. Mus. Godeffroy, vol. 8 (16) 1909, p. 273 (type of *Platyglossus nigromaculatus*).

Platyglossus nigromaculatus Günther, Proc. Zool. Soc. London, 1871, p. 666, pl. 65, fig. B. Savay, Samoa.

Halichoeres nigropunctatus Seale, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 89. Agaña, Guam.

Depth 2¾ to 3; head 3, width 2⅓ to 2⅖. Snout 3 to 3¾; eye 4¼ to 6, 1¼ to 2 in snout, 1⅙ to 1⅗ in interorbital; maxillary reaches about ¾ to eye, 3½ to 5 in head; single posterior canine, variously double, each side above and directed forward; interorbital 4 to 4½. Gill rakers 5+10, lanceolate, short, robust.

Scales in lateral line 22, 4 or 5+2; 3 scales above lateral line, 9 below, 3 predorsal. Scales with 38 to 46 basal and marginal radiating striae; apical 38 to 40, feeble and imperfect; circuli very fine.

D. VIII or IX, 11, 1, eighth or ninth spine 2⅞ to 3⅖ in head, first ray 2⅓ to 2½; A. III, 11, 1, third spine 3⅖ to 3¾, third ray 2⅛ to 2⅓; caudal 1¼ to 1⅙, truncate, convex when expanded; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅔ to 1⅗; ventral 1¾ to 1⅘.

Pale brownish generally. Head and trunk with large blackish brown blotches, none much larger than eye, more or less following rows of scales and largest on lower sides of trunk and tail. On head dark blotches often form vermiculations and fading out on frontal and under regions of head leave whitish blotches. Black ocellus at isthmus. Iris whitish. Fins all pale. Dorsals and anals with outer series of pale blotches and basal waved dusky longitudinal band. Caudal with 6 transverse deep lines, fewer and less distinct terminally in young. Pectoral pale or whitish. Ventral whitish, with 5 transverse dark bands.

Polynesia and Micronesia. Now known from the East Indian region, our specimens listed below. The species is especially handsome with the closely spotted or blotched color pattern.

9913. Inamucan Bay, Mindanao. August 8, 1909. Length, 99 mm. [1800.] Dark blotches not large, leaving olive greenish ground bright; back mainly without dark blotches, few tawny blotches showing metallic in some reflections near base of dorsal; in two groups of four each, first under spinous dorsal, second under soft dorsal and on peduncle; the stripes on head small. Spinous dorsal crossed by irregular oblique bars, upward and forward, each covering two membranes, somewhat broken forward, last four or five quite distinct; base of soft dorsal with series of green spots, limited by arching dark brown lines which form basal bar; extreme margin hyaline, reddish orange inframarginal bar with extension downward in each membrane not reaching basal bar, except in irregular instances; dorsal rays crossed by six brown bars, dark basally, becoming nearly scarlet on edges of lobes and tip of fin. Anal marked similarly to dorsal, less regularly. Ventrals with two reddish-brown bars, not dark. Pectoral hyaline, rays slightly dusky.

17454. Murcielagos Bay, Mindanao. August 9, 1909. Length, 122 mm.

22526. San Pascual, Burias Island. April 8, 1909. [1510.] Length, 107 mm. Olive, spots violet black anteriorly limited by blue; stripes on front of head brownish red; yellow along belly and anal base. Dorsal edge orange brown. Anal and caudal same. Throat blue, then orange. Body redder in places, especially on caudal, base brown.

9450. Simaluc Island. September 22, 1909. 2 examples. Length, 78 to 108 mm.

1 example, Sitanki Reef. September 24, 1909. Length, 94 mm.

52230 U.S.N.M. Apia. Bureau of Fisheries. Length, 71 to 103 mm. 3 examples.

Genus CORIS Lacépède

Coris Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 96, 97. Type *Coris aygula* Lacépède, designated by Jordan and Evermann, Genera of Fishes, vol. 2, 1917, p. 61.

Julis Cuvier, Bull. Soc. Philom. Paris, 1814, p. 90. Type *Labrus julis* Linnaeus, by tautonomy.

Aygula Rafinesque, Analyse de la nature, 1815, p. 87. Type *Coris aygula* Lacépède, virtually, as *Aygula* Rafinesque proposed to replace *Coris* Lacépède.

Neanis Gistel, Naturg. Thierr., 1848, p. ix. Type *Labrus julis* Linnaeus, virtually, as *Neanis* Gistel proposed to replace *Julis* Cuvier.

Hemicoris Bleeker, Proc. Zool. Soc. London, 1861, p. 411. Type *Halichoeres variegatus* Rüppell, orthotypic.

Pseudocoris Bleeker, Proc. Zool. Soc. London, 1861, p. 411. Type *Halichoeres heteropterus* Bleeker, orthotypic.

Ophthalmolepis Bleeker, Proc. Zool. Soc. London, 1861, p. 413. Type *Julis lineolatus* Valenciennes, orthotypic.

Body oblong, compressed. Hind canine absent or present. Scales small or moderate, 50 to 85 in lateral line. Head scaleless, sometimes patch of scales behind eye. Lateral line complete. Dorsal spines 9, rays 12, front spines usually produced and flexible. Anal spines 3, rays 12. Caudal rounded or forked.

Brilliant fishes of the coral reefs of the Indo-Pacific.

ANALYSIS OF THE SPECIES

a^1. Coris. Hind canine obsolete; scales, 60 to 62; front part of body with fine spots, larger on vertical fins, obsolete with age and body becoming black; size, large ..... **angulata.**

a^2. Hind canines present; body not becoming black with age.

b^1. Hemicoris. Scales 45 to 65.

c^1. Body without longitudinal white or yellow bands.

d^1. Side of head with 1 or 2 curved bluish bands; no black spot on opercular flap.

e^1. Dorsals with 1 or 2 black spots; no black blotch on opercular flap.

f^1. First membrane of spinous dorsal black and black blotch on front of soft dorsal; side of head with 2 irregular curved bands ..... **variegata.**

f^2. Small black spot at base of first membrane of spinous dorsal; 1 curved band on side of head ..... **batuensis.**

e^2. Dorsals without black spots.

g^1. Opercular flap with black blotch ..... **venusta.**

g^2. No black opercular blotch ..... **multicolor.**

d^2. Side of head without blue bands; black blotch on opercular flap and sometimes at caudal base ..... **philippina.**

c^2. Body with 5 or 6 yellow longitudinal bands, lower giving place to uniform pink with age ..... **flavovittata.**

b^2. JULIS. Scales 72 to 76; caudal yellow; tail and caudal peduncle with white or sky-blue spots, most numerous on latter ..... **gaimard.**

CORIS ANGULATA Lacépède

Coris angulatus LACÉPÈDE, Hist. Nat. Poiss., vol. 3, 1802, pp. 90, 96, pl. 4. fig. 2. No locality.

Coris aygula LACÉPÈDE, Hist. Nat. Poiss., vol. 3, 1802, pp. 96, 97, pl. 4, fig. 1. No locality (on COMMERSON).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 201 (Red Sea, India, Australia).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 539 (Koseir, Red Sea).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—DAY, Fishes of India, pt. 3, 1877, p. 408, pl. 88, fig. 5; Fauna British India, vol. 2, 1889, p. 418.—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 641, fig. 9. (Wakanoura).—OGILBY, Commerc. Fish. Fisher. Queensland, 1915. (North Queensland).

Julis aygula RÜPPELL, Atlas Reise Nördl. Afr., Fische, 1828, p. 25, pl. 6, fig. 3 (Gulf of Setie, Red Sea).

Labrus cingulum LACÉPÈDE, Hist. Nat. Poiss., vol. 3, 1802, p. 517, pl. 28, fig. 1. Mauritius.

Julis cingulum VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 428 Mauritius.

Coris cingulum GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 203 (Aneiteum and Mauritius).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 539 (Red Sea).—GÜNTHER, Cruise of Curacoa, Brenchley, 1873, p. 410 (Solomons).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 280, pl. 145 (Society, Friendly, and Solomon Islands, Aneiteum, Upolo).

Julis ruppelii BENNETT, Proc. Zool. Soc. London, 1831, p. 128. Mauritius (on RÜPPELL).

Labrus aureomaculatus BENNETT, Fishes of Ceylon, 1834, pl. 20. Ceylon.

Julis gibbifrons QUOY and GAIMARD, Voy. Astrolabe, Zool., vol. 3, 1834, p. 707, pl. 19, fig, 3. Mauritius.

Julis semipunctatus RÜPPELL, Neue Wirb., Fische, 1835, p. 12, pl. 3, fig. 3. Mohila, Red Sea.

Julis coris VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 491. Mauritius.

Coris cyanea MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 588. New Guinea.

Depth 2⅘ to 3; head 2¾ to 3⅛, width 2⅛ to 2⅗. Snout 2½ to 3⅛; eye 7½ to 9¾, 2½ to 3⅗ in snout, 1⅞ to 2¼ in interorbital; maxillary reaches ⅔ to eye, 3½ to 4⅗ in head; interorbital 4⅓ to 4⅞, convex, with slight convex prominence above eye. Gill rakers 7+11 or 12, lanceolate, short, some larger with 1 to several accessory points.

Scales in lateral line 51 or 52, 10 to 12+3 to 5; 9 to 12 scales above lateral line, 22 to 25 below, 19 or 20 predorsal. Scales with 28 to 46 basal radiating striæ; apical obsolete or very feeble; circuli fine.

D. IX, 12, 1, first spine 1⅔ in head, ninth 2⅓ to 3, first ray 2 to 2⅔; A. III, 12, 1, third spine 3⅓ to 3⅔, first ray 2¼ to 2¾; caudal 1⅔ to 1½, hind edge with each ray pointed and free, forming fringe behind; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅗ to 1¾; ventral 1¼ to 1⅔.

Largely uniform dusky brown, fins blackish. Other examples dull brown generally and broad transverse pale band at end of depressed pectoral, 4 or 5 scales in width. Head and front of trunk before transverse pale band with scattered gray spots, now pale and obsolete and some as short curved lines or bars. Opercular flap with dusky blotch, from size of pupil to little larger than eye. Vertical fins all deep brown, margins of dorsals and anals pale. Greater portion of spinous dorsal, at least basally, with dull brown spots. Paired fins dull brown. Ventrals little darker along front edge.

Red Sea, Mauritius, India, East Indies, Japan, Queensland, to the Society Islands. We adopt the name *Coris angulata* Lacépède as it has page priority. The *Labrus cingulum* seems to be the young or immature stage. Not previously reported from the Philippines or Riu Kiu.

A. 517 and A. 518. Bucuta Island. September 13, 1909. Length, 293 to 352 mm. Olive green, throat slightly slaty; posterior half of back with dark brown overshade, confined below back to margins of scales; vinaceous or reddish stripes and spots on side of head, forehead, and nape and anterior back somewhat similar to such spots in *Cheilinus*; black blotch on opercular flap. Dorsal dark bottle green, much spotted and mottled with some red as on head; margin of fin yellowish, distinctly so on soft part, resting on gray and indigo lines; these beginning on posterior spinous part; under indigo line reddish continuous as inframarginal bar. Caudal rays greenish, spotted with red, membranes bottle green, also with red spots; tips of rays bluish. Anal similar to dorsal, basal ¾ much spotted with reddish brown. Ventrals bluish, with second membrane reddish and few spots on posterior part of fin. Pectoral hyaline olive with dots of pale red on base in axil and behind axil. Body colors distinctly separated on line vertical to front of anal.

A1611. Nafa, Riu Kiu Islands. February 7, 1910. Length, 450 mm.

CORIS VARIEGATA (Rüppell)

Halichoeres variegatus Rüppell, Neue Wirbelth., Fische, 1835, p. 14, pl. 4, fig. 1. Djedda.

Julis variegatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 462 (Red Sea).

Hemicoris variegatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 106, pl. 36, fig. 4 (Amboina).

Coris variegata Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 198 (Red Sea).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 540 (Koseir).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Amboina and New Guinea).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34, pl. 1, 1911, p. 8 (Kei Island); Siboga Exp., vol. 57, Fische, 1913, p. 382 (Kei example).

Coris (*Hemicoris*) *variegata* Kossmann and Räuber, Zool. Ergebn. K. Acad. Wiss. Berlin, vol. 1, 1879, p. 25 (Red Sea).

Julis (*Halichoeres*) *schröderi* Bleeker, Act. Soc. Sci. Ind. Néerl. (Amboin.), vol. 3, 1857–58, p. 3. Amboina.

Depth 3⅓ to 3½; head 2⅞ to 3⅕, width 2¼ to 2⅘. Snout 3 to 3⅛; eye 4¼ to 6⅙, 1¼ to 1⅓ in snout, 1 to 1½ in interorbital; maxillary reaches ¾ to eye, 3¾ to 3⅘ in head; single posterior canine above each side directed forward; interorbital broadly convex, 4 to 4⅕ in head. Gill rakers 6+11, lanceolate, short.

Scales in lateral line 37 to 44, 8 to 14+2; 6 scales above lateral line, 18 or 19 below, 12 to 14 predorsal. Scales with 21 or 22 basal and marginal striae; feeble apical striae 14 or 15; circuli very fine.

D. IX, 11, 1, ninth spine 2⅓ to 2½ in head, first ray 2 to 2¼; A. III, 11, 1, third spine 3⅗ to 3⅘, first ray 2¼ to 2⅖; caudal 1⅙ to 1¼, truncate, convex behind as expanded; least depth of caudal peduncle 1¾ to 2⅛; pectoral 1½ to 1⅗; ventral 1⅖ to 1⅔.

Back pale brown, lower sides and under surface whitish, or each scale with light gray to whitish spot. Head with 4 or 5 grayish oblique variable bands, often broken or irregular; neutral slaty blotch close behind eye, but little larger than pupil. On back 6 deep brown vertical bars or short bands, extending but little below lateral line; alternating parallel white vertical line, also not continued lower, but giving place to short deep brown bar. Fins all pale. Grayish median longitudinal band on spinous dorsal and on front of soft dorsal; over 2 membranes sometimes forming blackish ocellus; first membrane of spinous dorsal with blackish blotch. Anal grayish white, with median and basal longitudinal band. At pectoral base small blackish blotch streaked down obliquely across base of fin.

Red Sea to the East Indies and Philippines. Rüppell's figure shows the dark postocular bar, the dorsal ocelli small and the transverse white lines on the back, though the broader alternate dark ones are absent. Bleeker's figure on the contrary fails to indicate the postocular bar or the white transverse lines on the back. One of our examples shows most of the scales on the side of the abdomen each largely deep brown. Bleeker had but 2 examples and those from Amboina.

11288. Alimango Bay, Burias Island. March 5, 1909. Length, 127 mm.

21127 and 21129. Biri Channel, Balicuatro Island. June 2, 1909. [1568.] Pale green, becoming paler below to gray washed with pink. On sides and back obscure broad stripes and bars of purplish, probably distinct in life. Dorsal greenish, margin vermilion, except on soft fin, extreme margin of which hyaline; irregular central bar of reddish; purplish or blackish blotch across middle of second soft ray; yellow above and below. Caudal yellowish green, with two irregular pinkish bars. Anal similar to soft dorsal but paler. Ventrals hyaline pink and pectorals dusky hyaline, blackish bar across base with yellow at bases of rays.

14808. Bugsuk Island, Balabac. January 5, 1909. Length, 123 mm.

19647. Bulan Island, Samales Group. September 13, 1909. Length, 126 mm.

7245 to 7247. Busbus Point, Siasi Island. September 20, 1909. Length, 94 to 140 mm.

10699. Cataingan Bay, Masbate. April 19, 1908. Length, 138 mm.

18682. Cebu market. March 24, 1909. Length, 164 mm.

15466. Galera Bay, Mindoro. June 9, 1908. Length, 119 mm.

13997. Gondra Island. September 20, 1909. Length, 144 mm.

10910. Isabel, Basilan. April 11, 1909. Length, 120 mm.
11369. Jolo reefs. March 6, 1908. Length, 148 mm.
17640. Mompog Island, Anabayan Island. March 3, 1909. Length, 128 mm. [1210.] Green, with obscure pale peach stripes; three distinct saddles of dusky reddish from below spinous dorsal and 2 or 3 obscure saddles posterior to these; head and breast pale, former with peach bloom stripes broadly across preorbital and cheek, same spots and darker on top of head and behind eye. Dorsal pink, with dark median stripe on spinous fin, ends in black blotch on first 2 soft rays; double row of median blotches through soft dorsal, paler than ground color. Anal obscurely barred. Caudal pale green, with 3 reddish bars. Black stripe at pectoral base.
22023. Panpan, Tara Island. September 26, 1909. Length, 104 mm.
17622 Port Langcan, Palawan. April 8, 1909. Length, 82 mm.
12234. Simaluc Island. September 22, 1909. Length, 86 mm.
4659. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 105 mm.
12371. Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 132 mm. [275.] Olive green; top of head and back darkest, becoming pale posteriorly and below; four dusky saddles across back double duplicated in dull buff in interspaces between; three or four longitudinal stripes of similar color anteriorly with reddish shades becoming ochraceous posteriorly; various mottling of same color posteriorly; scattered dusky on ventral region; buff saddle across nuchal region with black spot near each end; somewhat similar saddle on occiput; pale reddish black spot in center of roundish blotch in upper angle of opercle; four irregular stripes across interorbital; broader stripe of same color, reddish ochraceous, across preorbital on to premaxillary, defined below by narrow brown and blue stripes; purplish blotch behind eye; two purplish-pink lines across cheek, and opercle blotched with same color; upper and lower lips pale green. Dorsal tipped with red anteriorly, variously mottled with dusky greenish and reddish shades below; a black blotch above; soft part hyaline at tip, with reddish bars through middle portion of fin; brown and black blotch across middle of last two spines and first 3 rays, dash of yellow above; last ray citron yellow basally. Caudal membrane hyaline, rays alternate pale orange and green. Anal hyaline, tip resting on pale blue line; wavy pale purplish-pink line across fin basally, bordered bluish; medianly greenish shades and another pale purplish bar outside. Ventral greenish hyaline. Pectoral same, citron yellow base followed by black and lavender bars.
14294, 16274, 16492. Teomabal Island. September 18, 1909. Length, 99 to 128 mm.
18778. Tictauan Island. September 8, 1909. Length, 130 mm.
6423 and 18956. Tilig, Lubang. July 14, 1908. Length, 115 to 147 mm.
6171. Tonquil Island, east of Gumila reef. September 14, 1909. Length, 112 mm.
71554 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 145 mm.

CORIS BATUENSIS (Bleeker)

Julis (*Halichoeres*) *batuensis* Bleeker, Nat. Tijds. Ned. Indie, vol. 12, 1856–57, p. 240. Batu Island.
Hemicoris batuensis Bleeker, Atlas Ichth. Ind. Neérl., vol. 1, 1862, p. 107, pl. 36, fig. 3 (Batu).
Coris batuensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 194 (copied).

Depth 3⅛ to 3⅖; head 3⅓, width 2½. Snout 3⅛ to 3⅖; eye 4½ to 4¼, 1½ to 1⅘ in snout, 1 to 1¼ in interorbital; maxillary reaches ⅘ to eye, length 3⅔ to 3¾ in head; interorbital 4⅙ to 4¾, convex. Gill rakers 9+11, lanceolate, ⅗ length of gill filaments.

Scales in lateral line 40, 10+1; 7 scales above lateral line, 19 below, 15 predorsal. Scales with 14 to 20 basal radiating striae, apical 8 to 22; circuli fine.

D. IX, 11, 1, ninth spine 2⅔ to 2⅘ in head, first ray 2⅙ to 2⅕; A. III, 11, 1, third spine 3⅝ to 4⅛, first ray 2⅔ to 2½; caudal 1⅙ to 1⅓, convex behind; least depth of caudal peduncle 1⅞ to 2$\frac{1}{10}$; pectoral 1⅗ to 1¾; ventral 1⅔ to 2.

General color brown, little paler to whitish below. Head with a heliotrope band from near end of snout to eye. Usually 2 heliotrope blotches behind eye, of which one closest often with a deep neutral blue spot. Heliotrope arch across cheek and back over opercle. About 5 or 6 obscure dark blotches or short saddlelike bands on back, not extending down on sides below eye. Interspaces of each with short whitish narrow vertical bar or streak. All scales on sides and lower surface of abdomen with small whitish spots. Dorsals pale or whitish, with median longitudinal brown band; at front of spinous dorsal dusky and at front of soft dorsal as second enlarged dusky brown blotch; submarginally soft dorsal with gray band. Anals gray, with whitish median and basal longitudinal bands. Caudal whitish or pale, also paired fins, pectorals with dusky brown narrow basal bar.

Previously only known from the East Indies.

1 example, Cataingan Bay. April 17, 1908. Length, 73 mm.
1 example, Cebu market. September 3, 1909. Length, 108 mm.
1 example, Galera Bay, Mindoro. Length, 106 mm.

CORIS VENUSTA Vaillant and Sauvage

Coris venusta Vaillant and Sauvage, Rev. Mag. Zool., vol. 3, 1875, p. 285* Hawaiian Islands.—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, 1903 (1905), p. 312, pl. 31, fig. 133 (Honolulu and Hilo).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 275, pl. 44, figs. A–B (Honolulu).

Hemicoris remedius Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 49, fig. 5. Honolulu.

Depth 3⅖ to 3⅔; head 3⅕ to 3½, width 2½ to 2⅗. Snout 3⅛ to 3⅓; eye 5½ to 5⅞, 1⅔ to 1¾ in snout, 1⅕ to 1¼ in interorbital; maxillary reaches ⅔ to ⅘ to eye, length 4 to 4½ in head; interorbital 5 to 5⅛, convex. Gill rakers 6+12, short points.

Scales in lateral line 40 to 41, 8 to 10+1 or 2; 4 scales above lateral line, 17 or 18 below, 11 or 12 predorsal. Scales with 24 to 29 basal radiating striae; apical 3 to 9, obsolete; circuli very fine.

D. IX, 12, 1, ninth spine 2⅗ to 2¾ in head, first ray 2⅘ to 2⅓; A. III, 12, 1, third spine 3⅗ to 3¾, first ray 2 to 3¼; caudal 1¼ to 1⅓, convex behind; least depth of caudal peduncle 2⅛ to 2⅙; pectoral 1½; ventral 1¼ to 1⅓.

Brown or neutral brown, with plumbeous or gray tints anteriorly. Median brown band in front; 1 from side of snout to eye, then up

over front of interorbital; 1 from upper hind eye edge also across occiput broadly and band extending to suprascapula and along front of lateral line till nearly opposite soft dorsal origin; brown band from rictus to lower eye edge, then down over pectoral toward pectoral base; another curves from across mandible medianly back across upper side of chest; lowest brown band along under side of head and chest. Back from pectoral axil lighter brown band horizontally, giving place behind to irregular transverse dark gray crossbars and on tail 6 or more deeper gray median blotches. Opercular flap with light brown blotch little larger than eye, its hind edge narrow neutral dusky crescent. Iris yellowish. Dorsals grayish, with base deep gray; spinous fin with median horizontal buff band; soft dorsal medially and terminally with pale gray spots, smaller terminally. Anals gray, with row of light gray basal spots and outer half of fin with 4 darker longitudinal lines, sometimes broken or variable. Caudal gray, with pale brown to gray spots, smaller terminally. Paired fins pale brown.

Known only from Oceania in the Hawaiian subregion. Apparently close to *Halichoeres multicolor*, but differs in the coloration and fewer scales below the lateral line.

9417 and 9418. Midway Islands, reefs. November 7, 1907. Length, 147 to 150 mm.
51141 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 160 mm. 1 example.
55043 U.S.N.M. Honolulu. *Albatross* collection. Length, 127 to 145 mm. 2 examples.
55563 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 143 mm. 1 example.
78079 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 157 mm.
84088 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 125 to 143 mm. 2 examples.
9331 and 9332 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend.
17205 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend.
28249 A.N.S.P. Honolulu. Jordan and Snyder.
28116 to 28118 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 155 to 160 mm.

CORIS MULTICOLOR (Rüppell)

Halichoeres multicolor Rüppell, Neue Wirbelth. Fische, 1835, p. 15, pl. 4, fig. 3. Djedda.

Coris multicolor Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 198 (New Hebrides).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 541 (Red Sea).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 410 (Solomons); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 274 (New Hebrides and Solomon Islands).—Regan, Ann. Durban Mus., vol 1, 1914–17, p. 459 (Durban).

Depth 3⅗ to 3⅘; head 3 to 3¼, width 2⅖ to 3. Snout 2⅘ to 3; eye 5½ to 6½, 1⅘ to 2¼ in snout, 1 to 1⅕ in interorbital; maxillary reaches ⅔ to ⅘ to eye, length 3⅔ to 3⅘ in head; single small

posterior canine each side above and directed forward; interorbital 5⅛ to 5⅘, slightly convex. Gill rakers 5+11, lanceolate, short.

Scales in lateral line 40 or 41, 9 or 10+2 or 3; 6 scales above lateral line, 20 below, 12 predorsal. Scales with 21 to 26 basal radiating striae, 18 to 31 obsolete apically; circuli fine.

D. IX, 11, 1 or 12, 1, first spine 3⅖ to 4⅛ in head, first ray 2⅗ to 2⅘; A. III, 12, 1, third spine 4 to 4⅔, first ray 2⅘ to 3; caudal 1⅓ to 1⅗, convex behind; least depth of caudal peduncle 2½ to 2⅔; pectoral 1½ to 1¾; ventral 1⅖ to 1½.

Pale brown generally. Upper surface of head neutral brown and body with 6 broad transverse deep brown bands, separated by very narrow pale interspaces, and each band above with pale brown spot or vertical bar. Grayish longitudinal band from opercle midway along side to hind section of lateral line; another parallel from below eye to pectoral, then back above front of anal, where it ends in neutral gray blotch; third along lower side of head, sometimes interrupted as 2 parallel oblique short bands extend down from pectoral axil and then continue back till opposite vent. Ends of first 2 dorsal membranes white, rest neutral dusky; dorsals largely brownish, with darker brown streaks up basally from saddles of back, and submarginal outer brown line with upper posterior portions of fins grayish mottled with brown. Anals pale brown, with 4 longitudinal parallel lines along outer half of fin, and usually pale gray spots basally on fin. Caudal pale brown with oblique brown lines across each corner and middle of fin with waved transverse vertical lines. Paired fins pale brownish, neutral blue spot at pectoral axil. Iris brownish.

Red Sea to Melanesia. Not previously reported from the Philippines.

5582. Jolo market, Jolo. February 8, 1908. Length, 148 mm.

11914. Jolo market. February 11, 1908. Length, 180 mm. [76.] Upper third of side dark bluish green, lower two-third pinkish purple. A reddish yellow area under pectoral, 2 bright purplish areas on side behind vent. Six or 7 irregular narrow yellowish green transverse bars on back and sides. Dorsal base purplish green with yellowish green spots where bands from back emerge; outer half of fin dark olive green, the margin strawberry pink. An orange yellow spot on outer margin of first and second membrane. Caudal light greenish yellow with 6 dull red spots centrally; semicircular area of brick-dust red extending from peduncle to posterior margin, leaving tips of lobes green, red area margined with narrow purple line on lobe, dull olive green terminally. Vent pale greenish, the produced part red. Pectoral greenish-yellow.

7156 and 14297. Teomabal Island. September 18, 1908. Length, 150 to 156 mm.

4333. Vicinity of Jolo Island. Length, 123 mm. [1953.] Dr. 5558.

CORIS PHILIPPINA, new species

Depth 4 to 4⅙; head 3½ to 3⅗, width 2⅖. Snout 3¾ to 4; eye 5¼ to 5½, 1¼ to 1½ in snout, 1⅕ to 1¼ in interorbital; max-

illary reaches ¾ to ⅘ to eye, 4¼ to 4⅔ in head; interorbital 4⅔ to 5, convex. Gill rakers 5+11, lanceolate, short.

Scales in lateral line 48 to 51, 11 to 14+2; 4 to 6 scales above lateral line, 20 to 22 below, 12 to 14 predorsal. Scales with 20 to 22 basal radiating striae; circuli fine.

D. IX, 12, 1, ninth spine 2⅔ to 2⅞ in head, first ray 2⅖ to 2⅗; A. III, 12, 1, third spine 3⅗ to 3⅔, first ray 2⅞ to 3$\frac{1}{10}$; caudal 1⅓, slightly concave behind, slightly convex when expanded; least depth of caudal peduncle 2⅓ to 2⅕; pectoral 1⅖ to 1½; ventral 2⅖ to 2½.

Generally burnt umber on back, with grayish tinge below and lighter to whitish on under surfaces. On back and sides above each scale with slightly darker median spot. Whole side of head medianly with lilac tinge. Brown band from near snout end to eye. Lower surface of head whitish. Iris very pale yellowish white. Dorsals brownish basally, mottled with paler and whitish terminally. Other fins all pale to yellowish white. Deep dusky brown blotch on opercular flap little smaller than iris, though larger than pupil and another at bases of upper median caudal rays. These blotches only present in example with caudal truncate as retracted.

Known only from the two examples described above. They differ from *Coris variegatus* in the smaller scales and coloration. They also have no posterior canines and the dentition is quite feeble.

Type.—Cat. No. 89975, U.S.N.M.

11501. Sulade Island. September 17, 1909. Length, 103 mm. [1939.] Type.
1503 (Dr. 5527). Balicasag Island. August 11, 1909. Length, 108 mm. [1940.] Paratype.

(For the Philippine Islands.)

CORIS FLAVOVITTATA (Bennett)

Julis flavovittatus Bennett, Zool. Journ., vol. 4, 1829, p. 36. Hawaiian Islands.

Coris flavovittata Günther, Ann. Mag. Nat. Hist. London, ser. 3, vol. 8, 1861, p. 387 (name only); Cat. Fish. Brit. Mus., vol. 4, 1862, p. 205 (type); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 282 (Hawaiian Islands).

Julis eydouxii Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 455 (Hawaiian Islands).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 309, pl. 29 (Honolulu and Hilo).

Depth 3⅓ to 3½; head 3 to 3½, width 2⅔ to 2½. Snout 3$\frac{1}{10}$ to 3½; eye 4⅘ to 6, 1½ to 2 in snout, 1 to 1⅖ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3¾ to 4 in head; interorbital 4½ to 5, convex. Gill rakers 6+10, lancolate, short.

Scales in lateral line 36 to 41, 9+1; 5 or 6 scales above lateral line, 16 below, 11 predorsal. Scales with 15 to 24 basal radiating striae; apical striae 15 to 23, feeble or imperfect; circuli very fine.

D. IX, 12, 1, ninth spine 3¼ to 3⅖ in head, first ray 2⅗ to 2¾; A. III, 11, 1, third spine 4⅓ to 5, first ray 3 to 3 1/10; caudal 1¼ to 1⅓, convex behind; least depth of caudal peduncle 2 to 2⅕; pectoral 1¾ to 1⅘; ventral 1⅞ to 2.

Two blackish brown bands longitudinally along back. Upper band from near middle of snout above and follows back all along dorsals basally. Lower band from side of snout tip to eye, then broadens back to bases of upper caudal rays and out terminally in same. Narrow whitish line from snout tip to dorsal, divides dark bands on head and anteriorly and another close above lateral line divides them below dorsal bases. Entire under surface whitish. Iris pale yellowish. Dorsals with brown basal band and whitish terminally with two parallel longitudinal pale brown lines. Paired fins, anal and caudal largely whitish. In largest example pale brown streak on caudal from upper rudimentary rays backward and another on lower median rays, fading behind.

This species previously only known from the Hawaiian region is now reported from the Philippines, where three examples were obtained.

6096. Cebu market. August 12, 1909. Length, 113 mm.
A. 430. Philippines. Length, 137 mm.
[87.] Philippines. Length, 83 mm.
52819 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 190 to 210 mm. 2 examples.
55476 U.S.N.M. Honolulu. Fur Seal Comm. Length, 290 mm. 1 example.
9333 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend.
17208 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 427 mm.
28096 A.N.S.P. Hawaiian Islands. U. S. Fish Comm.
31719 A.N.S.P. Honolulu. Stanford University. Length, 263 mm.

CORIS GAIMARD (Quoy and Gaimard)

Julis gaimard Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 265, pl. 54, fig. 1. Maui, Hawaiian Islands.—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 305 (Honolulu and Hilo).

Julis gaimardi Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 500 ("Mowi").

Coris gaimardi Günther, Ann. Mag. Nat. Hist. London, ser. 3, vol. 8, 1861, p. 387 (name only).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 99, pl. 19, fig. 2 (Moluccas).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 200 (Copang, Timor); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 277 (Yap, Hawaii, Pelew Islands, Carolines).

Labrus formosus Bennett, Fishes of Ceylon, 1834, pl. 16 (Ceylon).

Julis formosus Swainson, Nat. Hist. Anim., vol. 2, 1839, p. 230, fig. 64 (copied Bennett).

Julis (Halichoeres) formosus Bleeker, Nat. Tijds. Ned. Indie, vol. 5, 1853, p. 169 (Celebes).

Julis formosa Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 643 (Riu Kiu).

Coris (Labrus) formosa Günther, Ann. Mag. Nat. Hist. London, ser. 3, vol. 8, 1861, p. 387 (name only).

Coris formosa Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 99, pl. 19, fig. 3 (Celebes and Amboina).—Günther, Fishes of Zanzibar, 1866, p. 100 (Zanzibar).—Day, Fishes of India, pt. 3, 1877, p. 407, pl. 86, fig. 5 (Malay Archipelago).

Coris formosus Day, Fauna British India, vol. 2, 1889, p. 418.

Coris pulcherrima Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 200. Amboyna, Tabitti, Aneiteum; Ann. Mag. Nat. Hist., London, ser. 3, vol. 8, 1861, p. 387 (name only).—Ishikawa and Matsuura, Prelim. Cat. Fish. Imp. Mus. Tokyo, 1897, p. 28 (Japan).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 381 (Salibabu Island).

Julis pulcherrima Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Depth 3¼ to 3⅓; head 3¼ to 3⅓, width 2¼ to 2½. Snout 2⅘ to 3⅙; eye 6⅓ to 6½, 2⅕ to 2½ in snout, 1⅖ to 1½ in interorbital; maxillary reaches ¾ to ⅘ to eye, 3⅗ to 3⅞ in head; interorbital 4⅓ to 4⅘, convex. Gill rakers 7+12, short, lanceolate.

Scales in lateral line 58 to 60, 14 to 16+1 or 2; 7 or 8 scales above lateral line, 29 below, 20 predorsal. Scales with 18 to 21 basal radiating striae; apical striae few and very imperfect or obsolete; circuli fine.

D. IX, 12, 1, first spine 1⅓ to 1⅖ in head, ninth spine 2⅞ to 3¼, first ray 2¼ to 2⅓; A. III, 12, 1, third spine 3½, first ray 2⅖ to 2⅔; caudal 1⅓ to 1½, hind edge little convex; least depth of caudal peduncle 1⅘ to 1⅞; pectoral 1⅖ to 1½; ventral 1⅓ to 1⅖.

Deep brown to slaty brown generally. Trunk, bases of dorsals and anals, tail and caudal base, all with blue spots, greatly crowded on caudal peduncle and out on caudal base. Median brown predorsal line; another from eye up toward dorsal origin and forward from eye toward snout tip; broader brown postocular band extends back in opercular flap; broad brown band arches from rictus toward eye and then across lower part of opercle; finally broad brown band along under side of head. Dorsals and anals each with 2 or 3 submarginal brown lines. Caudal, pale buff. Pectoral, dull brown. Ventral, brownish, front edge darker.

Zanzibar, Ceylon, East Indies, Riu Kiu, Micronesia, Hawaii. We feel that the *Labrus formosus* Bennett was simply a variant of the present species and have therefore followed Day in placing it in the synonymy. Not previously reported from the Philippines.

1434. Cebu market. March 21, 1909. Length, 220 mm.
18679. Cebu market. March 24, 1909. Length, 190 mm.
5393. Cebu market. April 7, 1908. Length, 200 mm.
13290. Gomomo Island. December 3, 1909. Length, 205 mm.
14424. Gubat, Sorsogon, Luzon. June 23, 1909. Length, 192 mm.
19198. Maagnas, Lagonoy Gulf, Luzon. June 7, 1909. Length, 214 mm.
8847. Maculabo Island. June 14, 1909. Length, 285 mm.
17452. Murcielagos Bay. August 9, 1909. Length, 220 mm.
17102. Simaluc, Bisibisi Island. September 23, 1909. Length, 180 mm.
11651. Tulnalutan Island. September 9, 1909. Length, 210 mm.

51124 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 243 mm. 1 example.
52228 U.S.N.M. Apia. Bureau of Fisheries. Length, 183 mm. 1 example.
52778 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length 265 mm. 1 example.
55362 U.S.N.M. Honolulu. Bureau of Fisheries. Length, 160 to 170 mm. 2 examples.
65885 U.S.N.M. Kambara, Fiji. *Albatross* collection. Length, 230 mm. 1 example.
72281 and 72282 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 251 mm. 1 example.
28196 to 28198 A.N.S.P. Hawaiian Islands. U. S. Fish Commission. Length, 193 to 212 mm.
9330 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 197 mm.
17203 A.N.S.P. Hawaiian Islands. Thomas Nuttall. Length, 230 mm.

Genus HOLOGYMNOSUS Lacépède

Hologymnosus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, p. 556. Type *Hologymnosus fasciatus* Lacépède, monotypic.
Hologymnos Dumèril, Zool. Analyt., 1806, p. 337 (126). Atypic. Type *Hologymnosus fasciatus* Lacépède.

Body elongate, well compressed. Head pointed, well compressed. Lips fleshy. Front canines 4 in each jaw; no hind canine. Scales very small, 90 to 120 in the lateral line. Lateral line complete. Dorsal with 9 spines and 12 rays. Anal with 3 spines and 12 rays. Caudal angles not extended.

Indo-Pacific. Probably a single species, widely distributed. Among all labroids this is well distinguished by the very small scales which average 100 or over.

HOLOGYMNOSUS SEMIDISCUS (Lacépède)

Labrus semidiscus (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 429, 473, pl. 6, fig. 2. Great Gulf of India.
Labrus doliatus (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 429, 473, pl. 6, fig. 3. Great Gulf of India.
Julis doliatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 504 (Mauritius).
Coris (*Hologymnus*) *doliata* Sauvage, Hist. Nat. Madagascar, Poiss., 1891, p. 462, pl. 49, fig. 5 (on Valenciennes, examples of *Julis annulatus* and *Julis doliatus*).
Labrus annulatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 455, 526, pl. 28, fig. 3. The Great Equatorial Ocean (Indo-Pacific).—Shaw and Nodder, Nat. Miscellany, vol. 24, 1912, pl. 1038 (Indian Seas).
Julis annulatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 501, pl. 388 (East Indies, Mauritius, Seychelles).
Coris annulata Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 202 (Mauritius, Seychelles); Fishes of Zanzibar, 1866, p. 100 (Zanzibar); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 280, pl. 146, fig. A (East Africa, Pelew Islands, Gilbert Islands, Society Islands).—Gilchrist and Thompson, Ann. S. African Mus., vol. 6, 1908–11, p. 258 (Durban, Natal).
Hologymnosus fasciatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 556, 557, pl. 1, fig. 3. Great Equatorial Ocean.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 96, pl. 20, figs. 1–2 (Celebes and Amboina).

Julis rosea Quoy and Gaimard, Voy. Astrolabe, Zool., 1834, p. 709, pl. 15, fig. 1. Mauritius.

Julis (*Julis*) *oxyrhynchos* Bleeker, Nat. Tijds. Ned. Indie, vol. 13, 1857, p. 74. Kajeli, Buru.

Hologymnosus oxyrhynchos Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 97, pl. 33, fig. 4 (type).

Coris elongata Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 201. Aneiteum, New Hebrides.

Coris semipartita Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 203. Mauritius.

Coris longipes Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 204. Aneiteum.

Depth 3⅗ to 4⅓; head 2⅞ to 3⅛, width 2¾ to 3⅕. Snout 2½ to 2⅔; eye 6½ to 9½, 2¾ to 3⅗ in snout, 1⅓ to 1⅗ in interorbital; maxillary reaches ½ to ⅗ to snout, 3⅘ to 4½ in head; interorbital 5½ to 6⅓ in head, convex. Gill rakers 6+10, short, lanceolate, larger with several accessory points.

Scales in lateral line 72 to 78, 22 or 23+9 or 10; 10 to 12 scales above lateral line, 42 below, 24 to 28 predorsal. Scales with 17 or 18 basal radiating striae; apical striae fine, imperfect or obsolete; circuli fine.

D. IX, 12, 1, ninth spine 2⅞ to 3 in head, first ray 2¾ to 2⅘; A. III, 12, 1, third spine 3¾ to 4, first ray 3 to $3\frac{1}{10}$; caudal 1⅗ to 1⅘, concave, truncate in young; least depth of caudal peduncle 3⅛ to 3⅖; pectoral 1⅘ to 1⅞; ventral 2 to 3.

Brown, slightly grayish below. Usually pale band behind middle of depressed pectoral transversely. Trunk and tail with 20 vertical narrow grayish bands. Head brownish, with slightly darker band louping from above nostrils down to maxillary and then up to eye; another curves up from middle of cheek to eye along its lower edge and then back to opercular flap, which with slight dusky apical spot above and lower apical edge grayish; also brownish streak from upper hind eye edge toward suprascapula. Fins all brown. Dorsals with 2 submarginal dark brown lines. Anal with darker brown submarginal line and median longitudinal brown band. Caudal with several grayish blotches, hind edge with buff crescent. Pectoral brown, dusky basally. Ventral brown, front edge darker.

Mauritius, East Africa to the East Indies, Melanesia and the Society Islands. We have united *Julis* (*Julis*) *oxyrhynchos* as the young.

4313. Cruz Point, Bohol. Length, 277 mm. March 25, 1909. (Dr. 5420.)
11915. Jolo Market. February 11, 1908. Length, 193 mm. [78.]
A. 404. Jolo Market. March 7, 1908. Length, 350 mm.
6542. Port Maricaban. July 21, 1908. Length, 280 mm.

Genus THALASSOMA Swainson

Thalassoma Swainson, Nat. Hist. An., vol. 2, 1839, pp. (172) 224. Type *Scarus purpureus* Forskål, monotypic.

Chlorichthys Swainson, Nat. Hist. An., vol. 2, 1839, pp. (173) 232. Type *Labrus bifasciatus* Bloch, designated by Swain, Proc. Acad. Nat. Sci. Phila., 1882, p. 275.

Bermudichthys Nichols, Proc. Biol. Soc., Wash., vol. 33, July 24, 1920, p. 62. Type *Bermudichthys subfurcatus* Nichols, orthotypic.

Body elongate or oblong, compressed. Snout short, obtuse. Front canines prominent. No hind canines. Scales large, 27 to 30 in lateral line, which continuous. Head scaleless. Slight scaly sheaths along dorsal and anal bases. Dorsal spines 8, slender, rays 12 or 13. Anal spines 3, first very small, rays 11.

Circumtropical. Brilliant green or blue fishes, often with yellow, red or black and greatly contrasted. Size moderate or small. Abundant in coral reefs.

ANALYSIS OF THE SPECIES

*a*¹. THALASSOMA. Opercle scaled above.
  *b*¹. Opercular scales in 3 or 4 series.
    *c*¹. Flanks with large green quadrangular blotches, formed by reddish ladder-like longitudinal design ..... **quinquevittatus.**
    *c*². Back and flanks with black transverse bands.
      *d*¹. Rosy bands from eye over cheek; dorsals without black spot; size moderate ..... **hardwicke.**
      *d*². Rosy band on side of snout and 2 postocular, none on cheek; small black spot at front of spinous dorsal, another at front of soft dorsal and third at caudal base above; size small ..... **schwanefeldi.**
  *b*². Opercular scales in a single series.
    *e*¹. Back and head above without numerous blackish spots; no black blotch at front of spinous dorsal.
      *f*¹. Pectoral with deep red-purple longitudinal band in upper half of fin to base of supero-median rays; no black blotches on back. **lunare.**
      *f*². Pectoral uniform, pale; 3 black blotches on back ..... **jansenii.**
    *e*². Back and head above with numerous blackish spots; black blotch at front of spinous dorsal ..... **umbrostigma.**
*a*². Chlorichthys. Head naked or scaleless.
    *g*¹. Head dusky blue or purple, more or less contrasted with rest of body.
      *h*¹. Head variegated with rosy or blue longitudinal bands; tip and hind pectoral edge black.
        *i*¹. Head with 4 arched deep red longitudinal bands. **lutescens.**
        *i*². Head with 2 blue longitudinal narrow lines ..... **melanochir.**
      *h*². Head uniform dusky purple; broad whitish transverse band on trunk ..... **duperrey.**
    *g*². Head not dark or in contrast with rest of body; each scale with dark vertical streak.
      *j*¹. Single white line from lower eye edge level with pectoral origin; small black spot at pectoral origin. **amblycephalus.**
      *j*². Body uniform brown ..... **ballieui.**

THALASSOMA QUINQUEVITTATUS (Lay and Bennett)

Scarus quinquevittatus Lay and Bennett, Zool. Beechey's Voyage, 1839, p. 66, pl. 19, fig. 3. Loo Choo Islands.

Julis güntheri Bleeker, Verslag. Akad. Wet. Amsterdam, vol. 13, 1862, p. 279. On *Julis* (*Julis*) *quadricolor* (not Lesson, Valenciennes, Bleeker, Nat. Tijds. Ned. Indie, vol. 19, 1859, p. 339); Act. Soc. Sci. Ind. Néerl., vol. 1 (No. 6), 1856, p. 55. Manado; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 94, pl. 34, fig. 1 (Celebes and Sangi).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 189 (Cape of Good Hope); Cruise of Curacoa, Brenchley, 1873, p. (410) 425, pl. 32, fig. *a* (Solomons); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 294, pl. 144, fig. *c* (Paumotus, Society Islands, Samoa, Kingsmills, Fanning, Solomons, Lifu, Loyalty Islands, Futuna).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 379 (Karakelang and Salibabu).

Thalassoma guntheri Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Calayan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Halichoeres iris Seale, Philippine Journ. Sci., vol. 4 (6), 1909, p. 522. Sitanki Island, Jolo Achipelago.

Depth 3⅔; head 3. Snout 2⅘; eye 5¾; maxillary 4, not quite reaching front nostril; interorbital little elevated. Scales 27 in lateral line, 2 above, 8 below, about 10 (?) predorsal. D. VIII, 14, eighth spine 3⅗ in head, first ray 3. A. III, 12, third spine 5¼, first ray 3⅕. Caudal 1⅔ in head, slightly double concave behind. Least depth of caudal peduncle 2⅛; pectoral 1⅗; ventral 2. Head with 2 red bands; first from snout to eye then toward pectoral origin; second from chin to lower eye edge, then down over side of chest below pectoral base. Body with 2 red parallel bands, upper from suprascapula to upper caudal rays, median from pectoral axil to caudal base medianly, and both united by close set red bars over trunk and front of tail. Black blotch at front of spinous dorsal and outer portion of pectoral black. Small blue spot at pectoral origin with red bar across base of fin. Fins otherwise uniform. Length, 112 to 117 mm. (Bleeker.)

Cape of Good Hope, East Indies, Philippines, Riu Kiu, Melanesia, Polynesia, Fannings. There is little doubt but that *Scarus quinquevittatus* Bennett is intended for the present species. It only differs in the dark median longitudinal band on the dorsals, likely the artist's exaggeration. This name will then have priority over the usual *Julis güntheri* of Bleeker.

Halichoeres iris is described with life colors greenish above, bluish below, with 7 purplish oblique bands over back down on sides medianly. Top of head and nuchal region purple, with 3 wide rosy-purple lateral bands, 1 from posterior of eye to posterior margin of opercle near base of pectoral, 1 from lower posterior portion of orbit to lower posterior margin of opercles, 1 from lower anterior margin of orbit to behind angle of mouth.

19226 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 124 to 143 mm. 3 examples.

52210 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 140 mm. 1 example.

71707 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 140 mm. 1 example.

THALASSOMA HARDWICKE (Bennett)

Sparus hardwicke Bennett, Select. Fish. Ceylon, 1828–30, pl. 12. Ceylon.

Julis dorsalis Quoy and Gaimard, Voy. Astrolabe Zool., 1834, p. 713, pl. 15, fig. 5. Mauritius.—Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 449 (type).—Peters, Arch. Naturg., 1855, p. 263 (Mozambique).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 94, pl. 34, fig. 4 (Java, Bawean, Sumatra, Batu, Nias, Celebes, Sangi, Flores, Amboina, Banda, Goram, Letti, New Guinea).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 190 (Mozambique, Ceylon, Moluccas, Phillipines, China, Hong Kong, Aneiteum, Fiji); Fishes of Zanzibar, 1866, p. 98 (Zanzibar).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina R.).—Day, Fishes of India, pt. 3, 1877, p. 403, pl. 85, fig. 7 (Moluccas).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (North Celebes, Sangi, New Guinea); Faun. British India, vol. 2, 1889, p. 412, fig. 141.—Vinciguerra, Giorn. Romano Scienz. Biol., ser. 2, vol. 19, 1890, p. 486 (Zanzibar).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 556 (Luzon, Manila, Navotas, Cavite, Santa Cruz, Samar, Villareal).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 28 (Japan).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 442 (Ternate and Batjan).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 295 (East Africa, Society Islands, Samoa).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 130 (Saonek, Waigiu).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 380 (Menado, Beo, Salibabu, Binongka, Kur).—Regan, Ann. Durban Mus., vol. 1, 1914–17, p. 459 (Durban, Natal).

Thalassoma dorsale Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 648 (Riukiu).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 31 (Manila).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Cagayancillo).—Franz, Abhandl. K. Bayer Akad. Wiss., vol. 4, Suppl. vol. 1, 1910, p. 53 (Sagami Bay).—McCulloch, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 347 (Murray Island, Queensland).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Julis semifasciatus Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 448. Mauritius.

Julis prostigma (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 450. Java. (Name in text.)

Labrus pulcherrimus (Forster) Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 450. Tahiti. (Name in text.)

Julis (*Julis*) *urostigma* Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 287. Cauer, Sumatra.

Thalassoma melanochir Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 537, pl. 20, middle figure. Padang, Sumatra.

Depth 3¼ to 3½; head 2⅝ to 3, width 2⅖. Snout 2½ to 2⅗; eye 5¼ to 6¾, 2½ to 3¾ in snout, 1½ to 1¾ in interorbital; maxillary 3⅔ to 4 in head, reaches ⅗ to ⅔ to eye; 2 canines in front of each jaw; interorbital 4 to 4¼. Gill rakers 5+16, short, robust.

Scales 21 or 22, 4 or 5 in lateral line to caudal base and 1 more on latter; 3 or 4 scales above lateral line, 9 below, 8 or 9 predorsal. Scales with 30 to 40 basal radiating striae, apical 22 to 30; circuli very fine. Few scales on opercle above and a few below and behind eye.

D. VII or VIII, 12, I to 14, I, seventh spine 4 to 4⅓ in head, fifth ray 2⅘ to 3; A. II or III, 11, I, third spine 5 to 5½, third ray 2⅘ to 3; caudal 1½ to 1¾, double concave behind or with ends but little exserted; least depth of caudal peduncle 2½ to 2⅗; pectoral 1⅘ to 1½; ventral 1½ to 2.

Olive above, below white, often with pale bluish tinge. Five deep rosy or purplish bands radiate from eye, uppermost across interorbital, 1 from front eye edge toward snout tip, and the others variably across cheek. Five to 7 black blotches or transverse bands across back; first usually narrow, irregular, sometimes extends as black blotch on pectoral origin. Reddish longitudinal band along side of back, upper edge of caudal peduncle and out along upper caudal edge; second band along median axis of trunk and tail to caudal base; lower edge of caudal peduncle and caudal fin reddish. Dorsals yellow, with deep gray median longitudinal band, narrowing and fading out on last dorsal rays. Anal whitish, often with small blackish blotch anteriorly. Caudal broadly dark gray posteriorly. Pectoral and ventral yellowish white, former with black streaks across base.

Mauritius, East Africa, East Indies, Philippines, China, Riukiu, Queensland, Melanesia, Polynesia. *Thalassoma melanochir* Fowler is simply a color variant, as we find examples with the pectorals terminally dark. *Sparus hardwicke* Bennett is the earliest name we find available for the species.

5680. Agojo Point, Catanduanes Island. June 10, 1909. Length, 136 mm.

22107. Alimango Bay, Burias Island. March 5, 1909. Length, 152 mm.

15262. Atulayan Island. June 18, 1909. Length, 153 mm.

23730. Biri Channel. June 1–2, 1909. Length, 85 mm.

17585. Biri Channel. June 2, 1909. Length, 170 mm.

17058. Bisucay Island, near Cuyo. April 9, 1909. Length, 173 mm.

10679 and 10680. Bubuan Island. February 14, 1908. Length 131 to 160 mm.

17426 and 19645. Bulan Island, Samales Group. September 13, 1909. Length, 127 to 178 mm.

11143, 16042, 16043, 17144. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 118 to 170 mm. [1781.] Bars on head wine purple; lateral stripe of posterior body near geranium. Tip of soft dorsal with olive shades. Anal very pale hyaline olive, round black blotch in front. Caudal dusky centrally, margins of lobes olive green, stripes geranium purple.

19036. Cagayan, Sulu Island. June 8, 1909. Length 178 mm. [1069.] Ground color of head dusky emerald; radiating about eye five broad stripes somewhat tawny over eye, becoming geranium on cheek; ground color of back yellowish green, about dusky apple; crossing back five purplish black obliquely and backwardly directed saddles; first two not meeting on top; round spot of

black on top of either side of peduncle; black about base of pectoral; below dorsal saddles connected distinctly anteriorly by a similarly colored stripe; through axial region a pink stripe about breadth of pupil, below general color bluish green and soiled white, almost slaty in region of peduncle. Dorsal dusky-white on tips of spinous portion, membranes yellow on soft portion; purple black stripe about equal to pupil from base of first spine to fourth, saddle arches somewhat upward; scaled portion of fin yellow green. Edges of caudal lobes greenish dusky, purplish pink stripe through middle of lobe and smoky purple area occupies most of central body of fin distally. Anal yellowish white with some smoky, obscure purplish blotches in middle of first soft membranes. Ventrals pale straw. Pectorals dusky, blackish at tip.

5622, 5626, 9791, 12576. Caxisigan Island. January 2, 1909. Length, 125 to 183 mm.

1 example, Cebu market. March 19, 1909. Length, 167 mm.

7665. Cebu market. April 4, 1908. Length, 107 mm.

7437. Dalaganem Island. April 8, 1909. Length, 188 mm.

19035. Dasol Bay. May 8, 1909. Length, 132 mm.

15464. Galera Bay, Mindoro. July 9, 1908. Length, 170 mm.

7186 to 7188. Gondra Island. September 20, 1909. Length, 85 to 180 mm.

17304. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 153 mm.

13065. Gomomo Island. December 3, 1909. Length, 133 mm.

14427. Gubat, Sorgoson, Luzon. June 23, 1909. Length, 134 mm.

11652. Inuamacan Island. September 9, 1909. Length, 183 mm.

10829. Langao Point, Luzon. June 24, 1909. Length, 160 mm.

12971. Langao Point, Luzon. June 24, 1909. Length, 148 mm.

21138. Ligpo Point, Balayan Bay, Luzon. January 18, 1908. Length, 102 mm.

21026. Little Santa Cruz Island. March 28, 1908. Length, 158 mm.

21027. Little Santa Cruz Island. May 28, 1908. Length, 118 mm.

11704. Lode Bay, Destacado Island. March 13, 1909. Length, 187 mm. [1381.]

19199 Maagnas, Lagonoy, Gulf of Luzon. June 7, 1909. Length, 145 mm.

11237. Mactan Island, Cebu. March 25, 1909. Length, 140 mm.

12345. Mansalay, Mindoro. June 4, 1908. Length, 148 mm.

18610 and 18611. Mompog Island, Anabayan, near Marinduque. March 3, 1909. Length, 137 to 142 mm. [1195.] Green, saddles black, with more or less reddish hues; markings on head red. Tip of soft dorsal yellowish. Lower fins and pectorals white, latter slightly yellow at base. Anal with dusky blotch in middle of front portion.

12497, 19023, and 19024. Northwest Verde Island. July 22, 1908. Length, 133 to 178 mm.

15673. Palag Bay vicinity, Luzon. June 16, 1909. Length, 178 mm.

7345. Palaui Island, west coast. November 18, 1908. Length, 145 mm.

2 examples, Pilas Island. September 12, 1909. Length, 109 to 136 mm.

12516. Polloc, Mindanao. May 22, 1908. Length, 145 mm.

14368. Port Caltom. December 15, 1908. Length, 150 mm.

13106 and 13107. Port Galera, Mindoro. Length, 148 to 187 mm.

10301, 10486, 10495, 10726, 11022. Port Maricaban. July 21, 1908. Length, 132 to 181 mm.

18172 and 18173. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 105 to 165 mm.

5085. Pujada, Mindanao. May 15, 1908. Length, 178 mm.

11337. San Roque, Leyte. July 29, 1909. Length, 122 mm.

15615. Silino Island. August 10, 1909. Length, 129 mm.

5786, 9452, 9454. Simaluc Island. September 22, 1909. 4 examples. Length, 90 to 177 mm.
9400. Surigao, Mindanao. May 8, 1908. Length, 118 mm.
22733. Talisse Island. November 9, 1909. Length, 163 mm.
19015 and 19016. Tapiantana Island. September 13, 1909. Length, 125 to 130 mm.
12901. Tobea Island. December 14, 1909. Length, 130 mm.
45. Tulnalutan Island. September 9, 1909. Length, 174 mm.
18256. Tomahu Island. December 11, 1909. Length, 138 mm.
13149 and 13152. Tumindao Island. February 26, 1908. Length, 106 to 122 mm. [329.]
7666. Ulugan Bay, Palawan. December 17, 1908. Length, 128 mm.
20121. Ulugan Bay, near mouth of Baheli River, Palawan. December 28, 1908. Length, 175 mm.
21332. Bira Birahan Island, off Borneo. December, 1909. Length, 175 mm.
13490. Basa Reef, Gulf of Boni, Celebes. December 17, 1909. Length, 147 mm.
13224. Doworra Island, Dutch East Indies. December 2, 1909. Length, 134 mm.
4802. Limbe Strait, Celebes. November 10, 1909. Length, 188 mm.
19489. Tana Keke Island, Celebes. December 21, 1909. Length, 142 mm.
18323. West of Malibagu Point, Celebes. November 21, 1909. Length, 140 mm.
13077. Makassar market. December 24, 1909. Length, 145 mm.
12938. Tidore Island, south of Ternate. November 25, 1909. Length, 165 mm.
18530. Tidore Island. November 24, 1909. Length, 97 mm.
71696 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 133 to 178 mm. 4 examples.
52403 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 74 to 169 mm. 7 examples.
31062 and 31063 A.N.S.P. Apia. Bureau of Fisheries. Length, 97 to 153 mm.
27724 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Type of *Thalassoma melanochir*.

THALASSOMA SCHWANEFELDI (Bleeker)

Julis (*Julis*) *schwanenfeldi* Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 288. Cauer, Sumatra.
Julis schwanefeldi Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 95, pl. 33, fig. 7 (Java and Sumatra).
Julis schwanefeldii Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 191 (Sumatra).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 556 (Luzon, Batangas, Nasugbu, Cebu).—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Maldives, Mulaku).

Depth 3⅗; head 3, width 2¼. Snout 3⅛; eye 4⅕, 1¼ in snout, 1⅛ in interorbital; maxillary reaches ⅔ to eye, 4⅕ in head; interorbital 4¼, broadly convex. Gill rakers 6+10, lanceolate, short.

Scales in lateral line 21, 4+1, tubes trifid; 2 scales above lateral line, 8 below, 5 predorsal; single scale on opercle above. Scales with 21 to 24 basal radiating striae, apical 19 or 20; circuli fine.

D. VIII, 13, 1, eighth spine 3⅔ in head, first ray 2⅔; A. III, 11, 1, third spine 2⅘, first ray 2¼; caudal 1⅙, truncate; least depth of caudal peduncle 2; pectoral 1⅔; ventral 2⅛.

Neutral brown generally, below pale to whitish. Head with lower sides grayish and traces of gray band on side of snout and 2 postocular. About 6 ill-defined dusky blotches on back. Iris pale yellowish white. Dorsals neutral dusky, with black blotch at front of spinous fin, another at front of soft fin and third at bases of last rays, fin otherwise clouded with darker basally; soft dorsal with narrow gray border. Anal dark gray, with subbasal longitudinal neutral dusky band and 2 submarginally, edge narrowly whitish. Caudal grayish, with dusky spot basally. Paired fins gray white, with neutral spot at pectoral origin.

East Indies. Though reported by Elera we have but a single example from the Philippines.

20113 Ulugan Bay, near mouth of Baheli River, Palawan. December 28, 1908. Length, 67 mm.

THALASSOMA LUNARE (Linnaeus)

Labrus lunaris Linnaeus, Syst. Nat., ed. 10, 1758, p. 283. In Indiis.

Julis lunaris Rüppell, Neue Wirbelth. Fische., 1835, p. 11 (Red Sea).—Valenciennes, Hist. Nat. Poiss., vol. 13, 1837, p. 409 (Massuah, Siau).—Peters, Arch. Naturg., 1855, p. 263 (Mozambique).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 90, pl. 33, fig. 5 (Java, Duizend Islands, Bawean, Sumatra, Nias, Singapore, Bintang, Biliton, Celebes, Sangi, Timor, Flores, Solor, Ternate, Batjan, Buru, Amboina, Haruko, Ceram, Goram, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 181 (Mozambique, Ceylon, type of *Julis porphyrocephala*, Amboina, Moluccas, China, Hong Kong, Aneiteum).—Kner, Reise Novara Fische, vol. 2, 1865, p. 256 (Java and Hong Kong).—Günther, Fishes of Zanzibar, 1866, p. 97 (Aden, Zanzibar, Seychelles).—Steindachner, Sitzs. Akad. Wiss. Wien, vol. 53 (1), 1866, p. 463 (Port Jackson).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 535 (Koseir, Red Sea).—Capello, Jorn. Sci. Math. Lisboa, 1872, p. 83 (Mozambique).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 410 (Solomons).—Bleeker, Poiss. Madagascar, Reunion, 1874, p. 65.—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Ceram and Amboina River).—Kossmann and Räyber, Zool. Ergebn. K. Acad. Wiss. Berlin, vol. 1, 1877, p. 25 (Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 403, pl. 86, fig. 1 (Andamans).—Károli, Termesz. Füzetek Budapest, vol. 5, 1881, p. 175 (Aden).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (Ternate and Mysore).—Giglioli, Ann. Mus. Civ. Geneva, vol. 26, 1888, p. 71 (Assab).—Day, Fauna British India, vol. 2, 1889, p. 413.—Boulenger, Proc. Zool. Soc. London, 1889, p. 240 (Muscat).—Picaglia, Atti. Soc. Nat. Modena, ser. 2, vol. 12, 1893, p. 33 (Red Sea, Aden, Massaua).—Kent, Great Barrier Reef, 1893, p. 296, pl. 16, fig. 13 (Cape Flattery, Queensland).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 555 (Luzon, Manila, Cebu).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Ambon).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 442 (Terñate and Batjan); Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 150 (Gischin).—Regan, Ann. Natal Mus., vol. 1, 1908, p. 246 (Kosi Bay).—Gilchrist and Thompson, Ann. S. Afr. Mus., vol. 6, 1908–1911, p. 198 (Durban).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 287 (South Sea, Hawaiian Islands).—Pellegrin, Ann. Z. Mus. Napoli, n. s. 3, No. 27, 1912, p. 8 (Red Sea).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 378 (Banda, Timor, Postillion Islands).—Regan, Ann. Durban Mus., vol. 1, 1914–1917, p. 170 (Durban).

Thalassoma lunare FOWLER, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 537, pl. 23 lower fig. (Padang, Sumatra).—JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 30 (Cavite).—SEALE, Philippine Journ. Sci., vol. 9, 1914, p. 69 (Hong Kong).

Thalassoma lunaris EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).

Scarus gallus FORSKÅL, Descript. Animal., 1775, pp. x, 26. Lohaja, Red Sea.

Labrus zeylanicus GMELIN, Syst. Nat. Linné, 1789, p. 1287. Ceylon.

Trichopus arabicus SHAW, Gen. Zool., vol. 4, 1803, p. 390. Arabian Seas.

Julis maculata LESSON, Mem. Soc. Hist. Nat. Paris, vol. 4, 1828, p. 402. Oualan.

Julis porphyrocephala BENNETT, Proc. Comm. Zool. Soc. London, vol. 2, 1832, p. 183. Ceylon.

Julis hardvickii GRAY, Ill. Ind. Zool., vol. 1, 1832, pl. 9, fig. 1. India.

Julis meniscus VALENCIENNES, Hist. Nat. Poiss, vol. 13, 1837, p. 415. East Indies, Seychelles, China Sea, Macao.

Julis mertensii VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1837, p. 421. Ulea.

Julis (*Julis*) *celebicus* BLEEKER, Nat. Tijds. Ned. Indie, vol. 9, 1855, p. 313. Manado, Celebes.

Julis truncatus CARTIER, Verh. Med. Phys. Ges. Würzburg, 1873, p. 105. Cebu.—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 556 (Cebu).

Depth 3¼ to 3⅗; head 3 to 3½, width 2⅙ to 2⅓. Snout 3⅛ to 3⅓; eye 4¼ to 6¾, 1½ to 2 in snout, 1 to 1¾ in interorbital; maxillary reaches ⅗ to ⅔ to snout, 4⅓ to 4⅔ in head; interorbital 4 to 4⅓, convex. Gill rakers 7+13, lanceolate, short.

Scales in lateral line 22, 3+2; 3 scales above lateral line, 9 below, 6 predorsal. Scales with 35 to 47 basal radiating striae, apical 37 to 41; circuli fine.

D. VIII, 13, I, eighth spine 4⅓ to 4¾ in head, first ray 3 to 3⅕; A. III, 11, I, third spine 3¾ to 4¼, first ray 2¾ to 3; caudal $1\frac{9}{10}$ to 2½ in combined head and body, deeply lunate, long pointed lobes exserted greater than length of median rays; in young, caudal slightly convex behind, 1¼ in head; least depth of caudal peduncle 1⅗ to 2; pectoral 1¼ to 1⅖; ventral 1⅖ to 2⅛.

Body variously brownish generally. Each scale on trunk and tail, except breast and belly, with vertical brown line. Head slaty, with various longitudinal arched dark gray lines. Chin brownish, with two slaty lines crossing transversely. Along breast and side of belly two slaty longitudinal bands, fading out before anal fin. Dorsals and anals with greater median and basal portions slaty, edges broadly pale buff. Caudal pale brownish or buff, with upper and lower rays forming exserted points medianly slaty, fading pale in points. Pectoral dull buff, rays of upper half slaty, though upper margin buff all around; small slaty spot at origin of fin. Ventral pale buff.

Red Sea, East Africa, and Natal to the East Indies, China, Riu Kiu, Japan, Polynesia.

To the already extensive synonymy we are obliged to add *Julis truncatus* Cartier, based on the young.

16286. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 101 mm.
13715, 14892, 14893, 22106. Alimango Bay, Burias Island. March 5, 1909. Length, 120 to 188 mm.
[1333.] Bagacay Bay, Escarpada Island, Naranjos Group. March 13, 1909. Length, 49 mm. Pale green above, blackish below, vertical stripes red. Vinaceous stripes on head, one from snout through eye to below point of opercle, another below eye to angle of gill opening; reticulations on top of head and nape; broad stripes across chin, running under eye to pectoral base. Dorsal green, with orange bar near tips, slightly broader one near base; round black blotch near center of fin, with pale edge. Anal with green center, outer third orange, base brownish orange. Caudal lemon yellow, red stripe through end lobe and black blotch at base. Paired fins very pale.
16813. Butauanan Island. June 12, 1909. Length, 143 mm.
17184 and 22284. Butauanan Island. June 13, 1909. Length, 128 to 188 mm.
11273. Biri Channel. June 1, 1909. Length, 187 mm.
4636. Bubuan Island. February 14, 1909. Length, 100 mm. [98.] Slaty green, with many narrow red bars corresponding to rays and membranes of dorsal. Head dark hooker green with many dark flecks, more or less vermiculated on top of head; one from tip of nose through eye falling downward on opercle to base of pectoral, across which forms bar; another parallel giving short branch across upper opercle; band across chin back of tip; another just behind, two meeting at corner of mouth, whence broad stripe curves backward and downward across subopercle, extends longitudinally below pectoral base to middle of fin; broad curved line parallel on subopercle, meeting opposite fellow; longitudinal stripe across breast and belly past base of ventral on either side, joining behind vent and extending as basal bar on anal; belly between sky-blue; tip of chin and premaxillary pale green. Base of dorsal body color, with purplish median bar about width of pupil, caerulean line defines above; tip of fin orange, apple green between latter and blue. Caudal chrome yellow, with blackish slate bar across base; vermilion lines across lobes edged by pale azure. Anal like soft dorsal. Ventral pale blue, spines and first membrane pink. Pectoral pale blue, with reddish brown spatulate stripe in upper half.
17427. Bulan Island, Oamabe Group. September 13, 1909. Length, 170 mm.
5354. Bumbum Island. September 25, 1909. Length, 167 mm.
17696 and 17697, 22783. Busin Harbor, Burias Island. March 8, 1909. Length, 170 to 200 mm.
7859 and 22424. Candaraman Island, Balabac. January 4, 1909. Length, 89. to 128 mm.
16430. Danawan Island and Si Amil Island. September 27, 1909. 2 examples. Length, 136 to 165 mm.
1 example, Endeavor Strait. December 24, 1908. Length, 210 mm. [973.]
6357 and 7131. Inamucan Bay, Mindanao. August 8, 1909. Length, 130 to 143 mm.
10908. Isabel, Basilan. April 11, 1909. Length, 155 mm.
22840. Isabel, Basilan. September 11, 1909. Length, 91 mm.
1 example, Jolo. March 6–7, 1908. Length, 145 mm.
5580 and 5581. Jolo market. February 11, 1908. Length, 181 to 202 mm.
8833. Mahinog, Camiguin Island. August 3, 1909. Length, 122 mm.
18572 to 18576. Malanipa Island. September 8, 1909. Length, 130 to 188 mm.
6204 and 6205. Malapascua Island. March 16, 1909. Length, 190 to 207 mm.
17214. Murcielagos Bay. August 9, 1909. Length, 186 mm.

4408. Polloc, Mindanao. May 22, 1908. Length, 228 mm.
10471. Port Maricaban. July 21, 1908. Length, 130 mm.
2 examples, Simaluc Island. September 12, 1909. Length, 110 to 141 mm.
5783, 9457 to 9464, 9475. Simaluc Island. Length, 104 to 236 mm. September 22, 1909.
17099. Simaluc Island. September 23, 1909. Length, 223 mm.
12374 to 12378, 12380. Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 102 to 208 mm.
7157 and 7158. Teomabal Island. September 18, 1909. Length, 197 to 212 mm.
14338. Tobea Island. December 14, 1909. Length, 138 mm.
18254 and 18255. Tomahu Island. December 11, 1909. Length, 126 to 170 mm.
13154 and 13161. Tumindao Island. February 26, 1908. Length, 76 to 155 mm.
19097. Varadero Bay. July 23, 1908. Length, 158 mm.
21721. Varadero Bay, Mindoro. July 24, 1908. Length, 126 mm.
7344. West coast of Palaui Island. November 18, 1908. Length, 175 mm.
7215 and 13459. Limbe Strait, Celebes. November 9, 1909. Length, 103 to 150 mm.
12767 to 12769. Limbe Strait. November 10, 1909. Length, 145 to 190 mm.
49303 U.S.N.M. Red Sea. Bellotti. Length, 130 mm. 1 example.
19228 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 215 to 244 mm. 3 examples.
52148 U.S.N.M. Suez, Egypt. Col. Univ. Length, 240 mm. 1 example.
56179 U.S.N.M. Luzon. Philippine Commission. Length, 95 mm. 1 example.
56429 U.S.N.M. Shanghai. P. L. Jouy. Length, 218 mm. 1 example.
66058 U.S.N.M. Jaluit, Marshall Islands. *Albatross* collection. Length, 157 mm.
27722 and 27723 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 100 to 150 mm.

THALASSOMA JANSENII (Bleeker)

Julis jansenii Bleeker, Act. Soc. Sci. Ind. Néerl. (Manado), vol. 1, 1856, p. 56. Manado, Celebes; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 91, pl. 34. fig. 5 (Java, Sumatra, Celebes, Sangi, Amboina, Letti).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 187 (Fiji and Aneiteum); Cruise of Curacoa Brenchley, 1873, p. 410 (Solomons).—Day, Fishes of India, pt. 3, 1877, p. 405, pl. 86, fig. 4; Fauna British India, vol. 2, 1889, p. 414.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 295 (East Indies, Ponape, New Hebrides, Fiji, Solomons, Lifu in Loyalty Islands).

Julis janseni Weber, Siboga Exp., vol. 57, Fische, 1913, p. 378 (Tiur).

Thalassoma janseni McCulloch, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 347 (Murray Island).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Depth 3⅕ to 3½; head 3 to 3⅕, width 2¼ to 2⅓. Snout 2½ to 3⅕; eye 5 to 6; maxillary 3⅘ to 4⅕, reaches ⅔ to ¾ to eye; interorbital 3½ to 4 in head, convex. Gill rakers 7+14, lanceolate.

Scales in lateral line 21 or 22, 5+1; 3 scales above lateral line, 9 or 10 below, 5 or 6 predorsal. Scales with 40 to 43 basal striae, apical 27 or 28; circuli fine.

D. VIII, 13, 1, eighth spine 3¼ to 4 in head, first ray 2¼ to 3; A. II, 11, 1, second spine 3¼ to 3¾, first ray 2⅖ to 2⅞; least depth of caudal peduncle 2 to 2¼; pectoral 1¼ to 1⅓; ventral 1 $\frac{9}{10}$ to 2⅕;

caudal 2½ to 3 in combined head and trunk, emarginate, ends exserted; 1½ in head in young.

Buff to whitish generally. Back usually with neutral dusky to neutral brown blotch on head above and predorsal, another across middle of spinous dorsal and as transverse band from soft dorsal to anal. Sometimes variable as 5 blackish blotches on head and back, when posterior and median as 2 pairs, last of which extending into front region of caudal peduncle. Humeral region white. Entire dorsal edges narrowly blackish. Neutral gray line across pectoral base, as small dark spot at fin origin. Caudal pale like belly, grayish basally and along upper and lower edges. Paired fins whitish or like belly, pectoral sometimes quite dark terminally.

East Indies, Melanesia, Polynesia, Micronesia.

13866. Cebu market. August 31, 1909. Length, 132 mm. [1872.]

5679. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 156 mm. [1780.] Head below eye, breast and belly translucent white; top of head grey, back with five broad saddles of blackish on olive divided by yellowish green; these bars four or five times breadth of interspaces, first on nape, second under posterior spinous portion, following two under soft dorsal and last on peduncle. Colors of body extend into dorsal fin; first two membranes black, three following blue, then black, thence blue to base of third soft membrane, whence black continues to posterior end of fin, broken extensions of last two interspaces; saddles extend downward about level of middle pectoral base, bordered by yellowish beneath; end of caudal peduncle pale greenish yellow; fin dusky hyaline with purplish shades on lobes. Pectorals greenish yellow at base and front from tip of first rays backward including ⅔ of last four or five rays black. Ventrals hyaline. Pectorals dusky hyaline, purplish at fleshy base. Iris silvery.

6425. Sulade Island. September 17, 1909. Length, 186 mm.

13153. Tumindao Island. February 26, 1908. Length, 117 mm. [343.]

71671 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 115 to 167 mm. 4 examples.

THALASSOMA UMBROSTIGMA (Rüppell)

Julis umbrostigma Rüppell, Neue Wirbelth., Fische, 1835, p. 11, pl. 3, fig. 2. Mohila and Djedda, Red Sea.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 92, pl. 34, fig. 2 (Java and Cocos Island).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 185 (Red Sea, China, Aneiteum).—Kner, Reise Novara, Fische, vol. 2, 1865, p. 257 (no locality).—Klunzinger, Verh. zool. bot. Ges. Wien, 21, 1871, p. 538 (Koseir, Red Sea).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 555 (Luzon, Cavite, Santa Cruz).—Regan, Ann. Natal Mus., vol. 1, 1908, p. 246 (Kosi Bay).—Gilchrist and Thompson, Ann. S. Afr. Mus., vol. 6, 1908–11, p. 198 (Natal).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 294, pl. 149, fig. 3 (Pelew Islands, Ponapé, Mortlock, Ruk, Aneiteum, Marquesas, Kingsmills, Society Islands, Samoa, Raratonga, Rotuma, Hawaii).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 378 (Salibabu).

Thalassoma umbrostigma Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 300, fig. 129 (Honolulu, Kailua, Hilo).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Calayan).

Julis purpurea (part) Day, Fishes of India, pt. 3, 1877, p. 404; Fauna British India, vol. 2, 1889, p. 414.

Julis punctatus Seale, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1901, p. 91. Agaña, Guam.

Thalassoma cyanogaster (not Valenciennes) Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 305, fig. 53 (Apia and Pago Pago, Samoa).

Depth 3¼; head 3. Snout 2⅖; eye 6⅘, 2½ in snout; maxillary not quite reaches front of eye, 3 in head.

Scales 27 in lateral line, of which last 1 on caudal base; 2 scales above lateral line, 9 below, 4 predorsal.

D. VIII, 13, I, eighth spine 4¼ in head; fifth dorsal ray 2¼; A. III, 11, I, third spine 4¾, second ray 3⅕; caudal 1⅗, truncate; least depth of caudal peduncle 2; pectoral 1½; ventral 2½.

Olive above, pale to whitish below. Side with 2 reddish longitudinal bands, upper level with body axis and lower from lower pectoral ray bases. Head above with deep brown spots and often irregular deep brown bars or short lines. Back and sides with small deep brown spots vertically, sometimes forming 5 or 6 cross-bands. Black spot at front of spinous dorsal. Dorsals and anals each with subbasal longitudinal band of reddish. Length, 180 mm. (Bleeker.)

Red Sea, Natal, Mauritius, East Indies, Philippines, China, Melanesia, Micronesia, Polynesia, Hawaii. Readily known by its dark, spotted coloration.

19225 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 143 mm. 1 example.

52265 U.S.N.M. Apia. Bureau of Fisheries. Length, 18 to 44 mm. 3 examples.

55040 U.S.N.M. Hawaiian Islands. *Albatross* collection. Length, 103 to 145 mm. 2 examples.

55208 U.S.N.M. Hawaiian Islands. *Albatross* collection. Length, 40 to 72 mm. 5 young examples.

65675 U.S.N.M. Cook's Bay, Easter Island. *Albatross* collection. Length, 30 to 65 mm. 37 examples.

71637 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 130 mm. 1 example.

2686 A.N.S.P. Honolulu. Stanford University. Length, 212 mm.

THALASSOMA LUTESCENS (Lay and Bennett)

Julis lutescens (Solander) Lay and Bennett, Zoology Beechey's Voy., 1839, p. 65, pl. 19, fig. 2. Tahiti and Riu Kiu.—Brevoort, Exped. Perry Jap. Fish., 1856, p. 271, pl. 8, figs. 3–4 (Nafa, Okinawa).

Thalassoma lutescens Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 647 (Nafa); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 214 (Honolulu).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Labrus lunaris (not Linnaeus) Bloch, Naturg. Ausl. Fisch., 1785, p. 129, pl. 282. East Indies.

Julis blochii Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 422 (on Bloch).

Julis aneitense Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 183. Aneiteum, Cato Island, Northeast Australia, Norfolk Island; Cruise of Curacoa Brenchley, 1873, p. 410 (Solomons).—Steindachner, Sitzs. Akad. Wiss-Wien, vol. 102 (1), 1893, p. 237 (Yokohama).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 209 (Ponape, Samoa, Solomons, Aneiteum).

Thalassoma aneitense Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905) p. 304, pl. 41 (Honolulu).

Thalassoma lunaris (not Linnaeus) Jordan and Evermann, Bull. U. S. Fish. Comm., vol. 23, pt. 1, 1903 (1905), p. 303 (Honolulu).

Thalassoma neanis (Jordan and Evermann) Jordan and Snyder, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 14, pl. 12, fig. 2. Honolulu.

Depth 3⅖; head 3, width 2⅖. Snout 3; eye 5⅕; maxillary reaches ⅗ to eye, 4⅛ in head; interorbital 4¼, slightly convex. Gill rakers 9+16, lanceolate, short.

Scales in lateral line 21, 4+2; 4 scales above lateral line, 9 below, 7 predorsal; patch of 7 scales on opercle above. Scales with 34 to 38 basal radiating striae, apical 29 to 31; circuli very fine.

D. VIII, 12, 1, eighth spine 4 in head, first ray 2⅞; A. II, 11, 1, second spine 4½, first ray 3¼; caudal 1⅕, concave, ends pointed; least depth of caudal peduncle 2¼; pectoral 1⅓; ventral 2⅕.

Brown generally. Head with 5 longitudinal brown bands, lower 3 more or less arched. Iris pale yellowish. Dorsals pale gray, with median longitudinal deeper gray band, blackish on second membrane of spinous fin. Anals whitish, with gray basal band. Caudal pale, upper and lower lobes grayish. Paired fins pale, with slight neutral gray spot at axil of pectoral and same fin with broad black terminal blotch, but this parallel with lower terminal edge of fin.

Queensland, Melanesia, Micronesia, Polynesia, and Hawaii. Not previously reported from the Philippines.

8350. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 135 mm.

19229 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 17 to 210 mm. 5 examples.

51652 U.S.N.M. Honolulu. E. T. Berndt. Length, 142 mm. 1 example (poor).

57785 U.S.N.M. Honolulu. Type of *Thalassoma neanis*.

6502 U.S.N.M. Ousima, Japan. W. Stimpson. Length, 128 to 165 mm. 2 examples.

71673 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 120 to 218 mm. 7 examples.

71697 U.S.N.M. Nafa. *Albatross* collection. Length, 164 to 193 mm. 3 examples.

71698 U.S.N.M. Okinawa. *Albatross* collection. Length, 160 mm. 1 example.

THALASSOMA MELANOCHIR (Bleeker)

Julis (*Julis*) *melanochir* BLEEKER, Act. Soc. Sci. Ind. Néerl. (Amboina R.), vol. 2, 1857, p. 77. Ambonia.

Julis melanochir BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 89, pl. 33, fig. 2 (Amboina).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862-p. 182 (Amboina).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina R.).—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 296, pl. 152, fig. B (Amboina; Hawaii).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 377 (Salibabu).

Depth 3⅔ to 3¾; head 3⅓ to 3⅔, width 2¼ to 2⅔. Snout 3¾ to 3⅘; eye 6, 1⅔ to 1¾ in snout, 1½ to 1¾ in interorbital; maxillary reaches ¾ to eye, 4¼ to 4⅘ in head; interobital 3⅔ to 3½, convex. Gill rakers 6+12, lanceolate, short.

Scales in lateral line 21, 4+2; 3 scales above lateral line, 8 below, 7 predorsal. Scales with 40 to 47 basal radiating striae, apical 40 to 55; circuli fine.

D. VIII, 13, I, eighth spine 3⅓ to 4⅙ in head, first branched ray 3 to 3⅕; A. III, 11, I, third spine 4⅓ to 5⅔, first ray 3 to 3⅕; caudal 2⅔ to 2½ in combined head and body, lunate, upper and lower rays extended in long, sharp, points, nearly or quite as long as median rays; least depth of caudal peduncle 1⅞ to 2 in head; pectoral 1¼ to 1⅓; ventral 2 to 2⅕.

Head deep slaty. Obscure blue line from snout to eye, then back to opercular lobe; another arched over cheek from rictus. Trunk and tail brownish, each scale with vertical brown line. Iris grayish. Dorsals deep grayish, with submarginal dark line. Anal pale gray. Caudal buff medianly and behind, upper and lower edges and bases, as well as prolonged points gray brown. Pectoral buff basally, with outer ⅖ of fin neutral black; at origin and down over greater part of its base narrow black triangle. Ventral pale.

East Indies.

1369. Malapascua Island. March 16, 1909. Length, 145 mm. Top of head dusky viridian; region from front of dorsal downward to below pectorals pale green, darker above; lower head green over purple; cheek and opercle dusky; ocher stripe from lower edge of eye curving backward to upper half of pectoral; similar stripe almost parallel but with more curve from below eye across cheek and interopercle; posterior portion of body wine red shades over green, becoming blue below, breast and belly bluish purple. Dorsal bright red, margin pale on black line; no ocelli or blotches. Central portion of caudal hyaline, each lobe continuing red color of posterior body, becoming dusky on extended tips, edges of lobes somewhat pale. Anal pale red, margin hyaline. Ventrals pale. Pectoral lemon yellow at base, violet black terminally; purplish area on upper base continuing somewhat on first ray.

7216. Limbe Strait, Celebes. November 9, 1909. Length, 146 mm.

12379. Hongkong, China. August 13, 1908. Length, 160 mm. [277.]

THALASSOMA DUPERREY (Quoy and Gaimard)

Julis duperrey Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 268, pl. 56, fig 2. Hawaiian Islands.

Julis duperrei Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 421 (Hawaiian Islands).

Julis duperreyi Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 291, pl. 148, figs. *b–c* (Hawaiian Islands).

Thalassoma duperrey Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 302, pl. 35, and fig. 130 (Honolulu, Hilo, Kailua, Laysan, between Maui and Molokai, Puako Bay).

Julis clepsydralis Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, 1882, p. 136. Johnston Island.

Thalassoma pyrrhovinctum Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 51, fig. 7. Honolulu.

Depth 3⅙ to 3¼; head 3⅕ to 3¼, width 2$\frac{1}{10}$ to 2¼. Snout 2⅞ to 3; eye 5 to 5⅗, 1⅗ to 2¼ in snout, 1⅕ to 1⅔ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3½ to 4⅖ in head; interorbital 3⅔ to 3⅞, convex. Gill rakers 6+13, short, lanceolate.

Scales in lateral line 19 to 21, 4+2; 4 scales above lateral line, 9 below, 8 predorsal. Scales with 55 to 59 basal radiating striae, apical 31 to 34; circuli very fine.

D. VIII, 13, I, eighth spine 2⅞ to 3⅙ in head, first ray 2⅓ to 2⅗; A. III, 11, I, third spine 4 to 4⅓, first ray 2⅖ to 2½; caudal deeply emarginate, tips of upper and lower rays exserted, as expanded hind edge convex behind, 2⅞ to 3¼ in combined head and body; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅕ to 1¼; ventral 1⅞ to 2.

Head neutral bluish or blackish. Broad whitish or gray white band around trunk, including predorsal and front of spinous dorsal. Rest of body olivaceous or brownish dusky. Pectoral whitish, with oblique blackish band from tip to bases of lower rays. Young with median blackish band.

Hawaiian region. Not previously reported from the Philippines.

19420. Sorsogon market. March 12, 1909. Length, 186 mm.

9415, 9419, 9421 and 9422. Midway Islands, reefs. November 7–8, 1907. Length, 135 to 175 mm.

26826 U.S.N.M. Johnston Island. Bureau of Fisheries. Type of *Julis clepsydralis*.

51130 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 160 mm. 1 example.

51149 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 162 mm. 1 example.

55037 U.S.N.M. Hawaiian Islands. *Albatross* collection. Length, 175 to 180 mm. 2 examples.

55351, 55353 to 55356 U.S.N.M. Honolulu. U. S. Fish Comm. Length, 28 to 178 mm. 65 examples.

55218 U.S.N.M. Honolulu. *Albatross* collection. Length, 37 mm.

55368 U.S.N.M. Honolulu. *Albatross* collection. Length 117 to 175 mm. 3 examples.

84082 U.S.N.M. Hawaiian Islands. Length, 130 to 140 mm. 2 examples (poor).

65673 U.S.N.M. Toboguilla Island. *Albatross* collection. Length, 158 mm.

9426, 15258, 17258 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 128 to 130 mm.

9431 to 9434 A.N.S.P. Oahu. Dr. W. H. Jones. Length, 127 to 160 mm.

28034 to 28037 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 112 to 122 mm.

28173 and 28174 A.N.S.P. Hawaiian Islands. U. S. Fish Comm.

28203 to 28228 A.N.S.P. Honolulu. Stanford University. Length, 30 to 70 mm.

28237 to 28244 A.N.S.P. Honolulu. U. S. Fish Comm. Length, 112 to 190 mm.

THALASSOMA AMBLYCEPHALUS (Bleeker)

Julis (*Julis*) *amblycephalus* BLEEKER, Nat. Tijds. Ned. Indie, vol. 11, 1856, p. 683. Ord, Malang, southwest Java.

Julis amblycephalus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 90, pl. 33, fig. 6 (Java and Celebes).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 182 (East Indies).—DAY, Fishes of India, pt. 3, 1877, p. 404; Fauna British India, vol. 2, 1889, p. 413.—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, pl. 152, fig. C (Ceylon, East Indies, Ponape, Huahine, Mortlocks, Rotuma).

Thalassoma amblycephalus SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Depth 4; head 3½, width 2⅓. Snout 4; eye 4⅓, equals snout, 1⅛ in interorbital; maxillary reaches ⅗ to eye, 4¼ in head; interorbital 3⅞, convex. Gill rakers 4+8, lanceolate, robust, short.

Scales in lateral line 21, 5+1; 3 scales above lateral line, 9 below, 5 predorsal. Scales with 29 to 36 basal radiating striae, apical 28 to 32; circuli fine.

D. VIII, 13, 1, eighth spine 4⅛ in head, first ray 3; A. III, 11, 1, third spine 4¼, first ray 3⅙; caudal 1⅛, concave behind; least depth of caudal peduncle 2; pectoral 1⅔; ventral 2½.

Back drab, upper edge of head, predorsal and basal region of dorsals dusky. From snout tip to eye and back above pectoral, then to bases of upper median caudal rays, dusky black band, ill-defined above, better defined below with bordering blackish line to pectoral origin. Iris slaty. Muzzle more or less grayish below. Dorsals neutral dusky basally, paler on soft dorsal behind and marginally whitish whole extent. Anal white. Caudal whitish, ends of upper and lower points pale dusky. Paired fins whitish and narrow blackish triangle at pectoral origin.

India, East Indies, Micronesia, Polynesia.

19646 [1932]. Bulan Island, Samales Group. September 13, 1909. Length, 88 mm. Upper surface from lower level of eye olive, becoming distinctly blackish on middle of head and side and in median dorsal line; scales of side with purplish center, remaining portion paler; general color, below dark upper surface, pale green, somewhat gray; narrow brown line through lower eye just above black one; broad green stripe under eye across cheek and opercle;

below from corner of mouth buff stripe with vinaceous upper edge. Dorsal pale edged, body of fin similar to dark area in middle of side. Caudal pale in center, each lobe dusky orange, color continuing somewhat on peduncle. Anal hyaline pink, tips colorless. Ventrals colorless. Pectorals very pale yellowish, rays somewhat dusky. Iris dark or silvery.

71734 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 89 to 108 mm. 4 examples.

THALASSOMA BALLIEUI (Vaillant and Sauvage)

Julis ballieui Vaillant and Sauvage, Rev. Mag. Zool., vol. 3, 1875, p. 248. Hawaiian Islands.

Thalassoma ballieui Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 297, fig. 128 (Honolulu).

Julis obscura Günther, Rep. Voy. Challenger, vol. 1, 1880, p. 61, pl. 26, figs. *a–b*. Honolulu.

Julis verticalis Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, 1882, p. 135. Johnston Island.

Depth 2⅞ to 3⅓; head 2⅞ to 3, width 2⅓ to 2⅔. Snout 2⅓ to 2⅔; eye 6 to 7½, 2⅖ to 3 in snout, 1¼ to 1½ in interorbital; maxillary reaches half-way to eye, 4 to 4⅛ in head; interorbital 4¾ to 5⅕, convex. Gill rakers 10+14, lanceolate, short.

Scales in lateral line 21, 4+2; 5 scales above lateral line, 10 below, 11 or 12 predorsal. Scales with 57 to 60 basal radiating striae, 30 to 43 apical; circuli fine.

D. VIII, 13, I, ninth spine 4¼ to 4⅖ in head, first ray 3 to 3⅕; A. III, 11, I, third spine 4⅖ to 5⅞, first ray 2⅔ to 3⅛; caudal 1¼ to 1⅔, emarginate, tips of lobes slightly exserted, when expanded hind edge little concave; least depth of caudal peduncle 2⅛ to 2⅕; pectoral 1⅗; ventral 2¼ to 2⅗.

Dull brown generally, each scale with median vertical dark brown line. Base of caudal deep brown, with narrow deep brown edge above and below. Other fins all uniform brown.

Hawaii, Johnston Island.

13519 to 13524. Midway Islands, reefs. November 7–8, 1907. Length, 146 to 180 mm.

26829 U.S.N.M. Johnston Island. Type of *Julis verticalis*.

51074, 52697, 52703, 52717 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 232 to 284 mm. 4 examples.

55357 and 55473 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 145 to 162 mm. 7 examples.

84083 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 133 mm.

Genus GOMPHOSUS Lacepede

Gomphosus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, p. 100. Type *Gomphosus caeruleus* Lacépède, designated by Jordan and Evermann, Genera of Fishes, vol. 1, 1917, p. 61.

Gomphosis Swainson, Nat. Hist. An., vol. 2, 1839, pp. 43, 173, 231. Type *Gomphosus caeruleus* Lacépède.

Acarauna Sewastianoff, Acar. Pisc. Thorac., 1796 (1802), p. 357. Type *Acarauna longirostris* Sewastianoff=*Gomphosus caeruleus* Lacépède.

Elops (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, 1802, p. 100. Type *Gomphosus tricolor* Lacépède.

Body elongate, compressed. Snout abruptly extended as long tube, with rather long jaws terminal. Front canines small; no hind canines. Gill-membranes attached to isthmus. Scales moderate, 25 to 30 in lateral line. Head scaleless. Lateral line complete. Dorsal spines 8, rays 13. Anal spines 2 or 3, rays 11.

Small, brilliant, though usually with dark shades, abundant through most the Indo-Pacific region. Easily distinguished by the extended tube-like snout.

ANALYSIS OF THE SPECIES

a^1. Head light, contrasted with brown body, each scale with dark basal blotch; vertical fins dark, rays with pale tips; caudal with narrow pale border behind ..... **varius.**

a^2. Head not lighter than blue or green of rest of body; vertical fins pale; dark and light bar across pectoral ..... **tricolor.**

GOMPHOSUS VARIUS Lacépède

Gomphosus varius Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 100, 104, pl. 5, fig. 2. Tahiti.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 193 (Aneiteum and Tahiti); Fishes of Zanzibar, 1866, p. 99 (Zanzibar and Angazilia Island or Great Comoro).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, 1897, p. 28 (Japan).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 650 (Kagoshima).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 289, fig. 125 (Honolulu, Kailua, Hilo).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 298, pl. 147, fig. 13 (Western Indian Ocean, South Sea, Fiji, Ponape).—Regan, Ann. Durban Mus., vol. 1, 1914–17, p. 459 (Durban).

Gomphosus pectoralis Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 282. Maui, Hawaii.—Day, Fishes of India, pt. 3, 1877, p. 406, pl. 86, fig. 6 (Andamans); Fauna British India, vol. 2, 1889, p. 416.

Gomphosus fuscus Bennett, Fishes of Ceylon, 1830, pl. 3, Ceylon.—Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 25 (Mauritius, Tahiti, Hawaii).—Brevoort, Exp. Chin. Jap. Perry, vol. 2, 1856, p. 272 (Riu Kiu Islands).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28; Mem. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, 1866, p. 147 (Madagascar).

Gomphosus melanotus Bleeker, Nat. Tijds. Ned. Indie, vol. 8, 1855, p. 457. Cocos Island, Indian Ocean.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 87, pl. 21, fig. 3 (Cocos Island and Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 193 (East Indies).—Klunzinger, Verh. zool. bot. Ges. Wien., vol. 21, 1871, p. 535 (Koseir, Red Sea).

Labrus nasutus Gunther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 193 (name in text).

Gomphosus undulatus Streets, Bull. 7, U. S. Nat. Mus., 1877, p. 85. Fanning Islands.

Depth 3⅘ to 4; head 2⅓ to 2⅖, width 3⅕ to 3½. Snout 1¾ to 2; eye 7½ to 9¼, 3⅘ to 5⅗ in snout, 1⅖ to 1⅗ in interorbital; maxillary 2 to 2⅙ in snout, 3¾ in head; interorbital 6⅛ to 6½, convex. Gill rakers 8+14, short, lanceolate.

Scales in lateral line 21 to 22, 4+2; 4 scales above lateral line, 8 or 9 below, 8 to 10 predorsal. Scales with 32 to 34 basal radiating striae, apical 26 to 34; circuli fine.

D. VIII, 13, 1, eighth spine 5⅘ to 7¼ in head, first ray 4 to 4⅖; A. III, 11, 1, third spine 6¼ to 7⅓, first ray 4½ to 5¼; caudal 2 to 2⅛, truncate to slightly emarginate, hind edge slightly convex behind as expanded; least depth of caudal peduncle 3¼ to 3⅖; pectoral 2⅛ to 2¼; ventral 3¼ to 3⅓.

Body pale brown anteriorly, dark brown posteriorly or on tail. Each scale of back and flanks, but not breast and belly, with small basal dark spot, more as bar in some cases. Head pale and dark streak forward from eye short space and 2 posteriorly, variable, often broken as spots. Dorsals and anals neutral dusky, both with narrow gray edges and latter with median row of pale spots, 1 on each membrane. Caudal largely dusky brown basally and medianly, with hind edge broadly though variously wide of pale yellowish. Paired fins pale brownish, with small deep brown spot at pectoral origin.

Red Sea, Madagascar, Mauritius, Ceylon, East Indies, Riu Kiu, Japan, Micronesia, Hawaii, and Tahiti.

11996. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 192 mm.
22528. Dalaganem Island. April 8, 1909. Length, 155 mm.
17524. Lampinigan Island. September 11, 1909. Length, 160 mm.
16398. Mansalay, Mindoro. June 4, 1908. Length, 149 mm.
9936. Matnog Bay. May 31, 1909. Length, 144 mm.
18963. Port Maricaban. July 21, 1908. Length, 168 mm.
6701. Singaan Island. September 21, 1909. Length, 203 mm.
19230 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Type of *Gomphosus undulatus*.
55035 U.S.N.M. Honolulu. *Albatross* collection. Length, 140 mm. 1 example.
55036 U.S.N.M. Honolulu. *Albatross* collection. Length, 107 to 178.mm. 3 examples.
51039 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 103 to 148 mm. 2 examples.
52215 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 58 to 100 mm. 3 examples.
9404 and 9405 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 125 to 183 mm.
28193 A. N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 130 mm.

GOMPHOSUS TRICOLOR Quoy and Gaimard

Gomphosus tricolor Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 280, pl. 55, fig. 2. Hawaiian Islands.—Bleeker, Atlas Ichth. Ind. Neérl., 1, 1862, p. 85, pl. 21, fig. 6 (Celebes, Sumatra, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 193 (China, Ceylon).—Day, Fishes of India, pt. 3, 1877, p. 406; Fauna British India, vol. 2, 1889, p. 416.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 556 (Luzon, Cavite, Santa Cruz).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 649 (Nafa, Okinawa).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 290, pl. 36 (Honolulu and Hilo).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 297 (Mortlock and Hawaiian Islands).

Gomphosus viridis CUVIER, Règne Animal, ed. 2, vol. 2, 1829, p. 261 (on QUOY and GAIMARD).—GUERIN, Icon. Règne An. Cuvier 1829–38, p. 44, pl. 48, fig. 2.

Gomphosus ornatus BENNETT, Life of Raffles, 1830, p. 690, Sumatra.

Gomphosus cepedianus VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 18, pl. 390. Hawaii, Carolines, Tahiti.

Gomphosus sandvicensis GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 194. Hawaiian Islands.

Gomphosus pacificus SEALE, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 94. Guam.

Depth 2⅗ to 3¼; head 2½ to 3⅔, width 3 to 3⅛. Snout 1⅞ to 2; eye 8¼ to 10, 5 to 5½ in snout, 1⅓ to 1¾ in interorbital; maxillary 2⅕ to 2¼ in snout, 4⅙ to 4⅔ in head; interorbital 5⅔ to 5¾, convex. Gill rakers 11+14, short, lanceolate.

Scales in lateral line 21 or 22, 4+2; 3 or 4 scales above lateral line, 10 below, 9 predorsal. Scales with 41 to 45 basal radiating striae, apical 26 to 28; circuli very fine.

D. VIII, 12, 1 to 14, 1, eighth spine 6½ to 6⅘ in head, first ray 4⅗ to 4⅘; A. III, 11, 1 or 12, 1, third spine 7 to 7⅛, first ray 4½ to 4¾; caudal 1⅞ to 2, slightly concave, upper and lower tips slightly exserted, when expanded median rays form slightly convex behind; least depth of caudal peduncle 3 to 3¼; pectoral 2 to 2⅛; ventral 2⅘ to 3⅓.

Brown generally. At beginning of lateral line and close above, then down to pectoral axil pale oblique band. Dorsals, anals and caudal largely pale yellowish, only upper and lower edges of caudal and base of fin dark brown. Pectoral base pale, greater outer portion of fin dusky to blackish, with submarginal oblique slaty band; small black spot at pectoral origin. Ventral dull brown.

Ceylon, China, Riu Kiu, East Indies, Micronesia, Hawaii, Tahiti.

17185. Butauanan Island. June 13, 1909. Length, 172 mm.

11995. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 215 mm.

20098. Cagayan, Sulu Island. January 8, 1909. Length, 160 mm. [1068.] General color when faded berlin blue; with strong shade of olive green in life; beak, lower head, breast and belly smoky purple with obscure reddish blotches on scales and dashes on opercle. Dorsal and anal emerald, becoming yellowish terminally; dash of purplish in basal portion of dorsal membranes, most distinct anteriorly, where covers last ray. Edge of caudal lobes purplish shades; body of fin bluish green. Ventral dusky. Pectoral blackish, dark green at base with black spot at base of first ray; membranes hyaline terminally, perhaps purple through center of fin in life.

10830 and 13344. Langao Point, Luzon. June 24, 1909. Length, 236 to 252 mm.

6184. Palag Bay vicinity, Luzon. June 16, 1909. Length, 200 mm.

1 example, Pilas Island. September 12, 1909. Length, 181 mm.

1 example, Port Langcan, Dumaran Island. April 8, 1909. Length, 165 mm.

13288. Tobea Island. December 14, 1909. Length, 188 mm.

51057 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 203 mm. 1 example.
52202 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 198 to 203 mm. 2 examples.
52674 U.S.N.M. Puako Bay. Bureau of Fisheries. Length, 193 mm.
52744 and 52750 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length 260 to 265 mm. 2 examples.
55033 U.S.N.M. Hawaiian Islands. *Albatross* collection. Length, 205 mm. 1 example.
55360 U.S.N.M. Hilo, Hawaii. Length 160 mm. Bureau of Fisheries.
55469 U.S.N.M. Honolulu. *Albatross* collection. Length, 180 to 240 mm. 2 examples.
62362 U.S.N.M. Honolulu. E. L. Berndt. Length, 333 mm. 1 example.
9406 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend.
17213 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 200 mm.
28095 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 230 mm.
28250 A.N.S.P. Honolulu. Jordan and Snyder. Length, 167 mm.
29663 A.N.S.P. Honolulu. Jordan and Snyder.
31704 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 220 mm.
51100 to 51102 A.N.S.P. Honolulu. Jordan and Snyder. Length, 167 to 225 mm.

Genus CHEILIO Lacépède

Cheilio Lacépède, Hist. Nat. Poiss., vol. 4, 1803, p. 432. Type *Cheilio auratus* Lacépède; designated by Bonaparte, Fauna Italica, Pesc., vol. 1, 1841, fasc. xxx.

Chilio Peters, Monatsb. Akad. Wiss. Berlin, 1855, p. 263. Type *Cheilio auratus* Lacépède.

Micropodus Rafinesque, Analyse de la nature, 1815, p. 86. Type *Cheilio auratus* Lacépède, virtually, as *Micropodus* Rafinesque a substitute for *Cheilio* Lacépède.

Eupemis Swainson, Nat. Hist. An., vol. 2, 1839, p. (173) 232. Type *Labrus fusiformis* Rüppell, monotypic.

Body elongate, compressed. Teeth small, uniserial. No hind canines. Scales 45 to 50 in lateral line. Cheeks scaleless and few rudimentary scales on opercle. Lateral line continuous. Dorsal with 9 flexible spines, not produced, rays 13. Anal spines 3, rays 11. Indo-Pacific. Slender labroids of rather large size.

CHEILIO INERMIS (Forskål)

Labrus inermis Forskål, Descript. Animal., 1775, p. 34. Moccha, Red Sea.

Cheilio inermis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 82, pl. 31, fig. 4 (Java, Bawean, Sumatra, Celebes, Sangi, Ternate, Amboina, Banda, Ceram, Goram, Buru, Timor, Letti).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 194 (Mozambique, Macassar, Amboina, Philippines, Aneiteum); Fishes of Zanzibar, 1866, p. 99 (Aden and Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 530 (Koseir, Red Sea).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Ternate and Amboina).—Day, Fishes of India, pt. 3, 1877, p. 407, pl. 88, fig. 4 (Malay Archipelago).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (Cebu, Celebes, Tabukan, Sangi, Mysore).—Vinciguerra, Giorn. Romano Scienz. Biol., ser. 2, vol. 19, 1890, p. 486 (Zanzibar).—Sauvage,

Hist. Nat. Madagascar, Poiss., 1891, p. 465.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 557 (Luzon, Manila Bay, C. de Cebu).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 644 (Honolulu, Okinawa, Hilo, Formosa).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Cuyo).—Gilchrist and Thompson, Ann. S. Afr. Mus., vol. 6, 1908–11, p. 199 (Natal).—Günther, Journ. Mus. Godeffrey, vol. 8 (16), 1909, p. 283 (Indo-Pacific to Hawaii).—Weber, Abhandl. Senckenberg. Nat. Ges., vol. 34 (1), 1911, p. 8 (Kei Island).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Amboina).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1888, p. 130 (Saonek).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 381 (Macassar, Menado, Tiau, Saleyer, Nusa Laut, Banda, Rotti).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).—Fowler, Proc. Acad Nat. Sci. Phila., 1925, p. 259 (Delagoa Bay).

Chilio inermis Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—Day, Fauna British India, vol. 2, 1889, p. 416, fig. 143.—Steindachner, Abhandl. Senckenberg. Ges., vol. 15, 1900, p. 442 (Ternate and Batjan).

Labrus hassek Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 244, 513 (on Forskål). Arabia.

Cheilio auratus Lacépède, Hist. Nat. Poiss., vol. 4, 1803, pp. 432, 433, Mauritius.—Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 274, pl. 54, fig. 2 (Hawaiian Islands).—Guichenot, Notes I. Reunion, vol. 2, 1862, p. 28.

Chilio auratus Peters, Arch. Naturg., 1855, p. 263 (Mozambique).

Cheilio fuscus Lacépède, Hist. Nat. Poiss., vol. 4, 1803, pp. 432, 433. Mauritius.

Labrus fusiformis Rüppell, Neue Wirbelth., Fische, 1835, p. 7, pl. 1, fig. 4. Djedda and Massaua.

Cheilio cyanochloris Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 346, pl. 382. Mauritius.—Guichenot, Notes I. Réunion, vol. 2, 1862, p. 28.

Chilio cyanochloris Peters, Arch. Naturg., 1855, p. 263 (Mozambique).

Cheilio forskalii Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 349 (on Forskål). Mauritius and Suez.

Cheilio hemichrysos Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 351. Hawaiian Islands.—Brevoort, Exp. Chin. Jap. Perry, vol. 2, 1856, p. 272 (Riu Kiu Islands).

Cheilio viridis Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 352. Vanicolo.

Cheilio microstoma Valenciennes, Hist. Nat. Poiss., vol. 13, 1839, p. 353. No locality, likely India.

Cheilio ramosus Jenyns, Voy. Beagle, Fish., 1842, p. 102. Japan?

Cheilio bicolor Bianconi, Mem. Acad. Sci. Bologna, vol. 8, 1859, p. 460, pl. 25. Mozambique.

Cheilio udanad Thiollière, Faun. Woodlark, 1857, p. 192. Woodlark Island.

Depth 6½ to 6¾; head 2⅝ to 2$\frac{9}{10}$, width 3⅓ to 3½. Snout 2¼ to 2⅓; eye 7 to 7⅓, 2⅞ to 3⅖ in snout, 1⅙ to 1⅕ in interorbital; maxillary reaches ⅔ to ¾ to eye, 3 to 3⅛ in head; interorbital 7⅛ to 7⅖, little convex. Gill rakers 8 + 17, short, lanceolate.

Scales in lateral line 45+1; 5 scales above lateral line, 11 below, 10 predorsal. Scales with 31 to 35 basal radiating striae; apical 53 to 72; obsolete; circuli, fine.

D. IX, 13, 1, ninth spine 4 to 4⅓ in head, first branched ray 3½ to 4; A. III, 12, 1, third spine 4⅕ to 5, first branched ray 3½ to 4; caudal 1⅚ to 2⅛, convex behind; least depth of caudal peduncle 4 to 4⅕; pectoral 2¾ to 2⅞; ventral 4 to 4⅗.

Back and upper surface brown, sides and below whitish. Along middle of side 6 dusky or blackish spots, sometimes same as small clusters of 1 to 3 small blackish spots. Fins dull brown.

Red Sea, East Africa and Mauritius to the East Indies, Australia, Formosa, Riu Kiu and Hawaii. Reaches 400 mm. in length. In life quite variable in color, from olive to orange or yellowish.

7819. Bugsuk Island. January 5, 1909. Length, 275 mm.

21695 and 21696. Cabugao Bay, Catanduanes Island. June 9, 1909. Length, 65 to 130 mm. [1624.] 3 examples.

21050. Capunuypugan, Mindanao. May 9, 1908. Length, 203 mm.

21762. Cebu market. March 20, 1909. Length, 215 mm.

5336 to 5338, 18365. Cebu market. April 4, 1908. Length, 194 to 330 mm.

21656. Cebu market. August 28, 1909. Length, 180 mm.

A599. Gondra Island. September 20, 1909. Length, 265 mm.

6353. Inamucan Bay, Mindanao. August 8, 1909. Length 233 mm.

4851. Jolo market, Jolo. February 11, 1908. Length, 270 mm.

7753. Jolo market, Jolo. February 12, 1908. Length, 240 mm.

5173. Jolo. March 7, 1908. Length, 261 mm. Back dark olive green, edges of scales paler, becoming paler below; buff on lower head, slight yellowish wash on breast and belly; centers of scales in lower sides bluish, edges with brownish shade becoming nearly orange under pectoral base; black blotch mainly under lateral line just beyond pectoral tip and few small black blotches on lateral line posteriorly; narrow orange line from mouth angle nearly to preopercle angle, bluish stripe below to under subopercle edge pale with narrow brownish anterior shade and another behind on opercle; small indistinct blotch near opercle tip. Rays of vertical fins like body color. Caudal membranes with very indistinct markings. Dorsal and anal recticulated and barred with narrow orange brown lines. Paired fins very pale, slightly greenish; pectoral with brown bluish line at base.

19200. Maagnas, Lagonoy Gulf, Luzon. June 7, 1909. Length, 210 mm.

16948. Mahinog, Camiguin Island. August 3, 1909. Length, 208 mm.

18688. Port Jamelo, Luzon. July 13, 1908. Length, 236 mm.

6543. Port Maricaban. July 21, 1908. Length, 133 mm.

15837. Sitanki Reef. September 24, 1909. Length, 144 mm.

2 examples, Tara Island. December 15, 1908. Length, 54 to 59 mm.

18920. Tictuan Island. September 8, 1909. Length, 194 mm.

9151. Varadero Bay, Mindoro. July 23, 1908. Length, 207 mm.

A797. Zamboanga market. October 6, 1909. Length, 374 mm.

A1619. Nafa, Loo Choo market. February 7, 1910. Length, 270 mm.

17977 U.S.N.M. Honolulu. Dr. T. H. Streets. 4 examples. Length, 157 to 166 mm.

51044 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. 1 example. Length, 272 mm.

52045 U.S.N.M. Negros. Dr. B. Dean. 2 examples. Length, 101 to 244 mm.

52478 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 2 examples. Length, 353 to 395 mm.
52679, 52680, 52690, 52700, 52742, 52749 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 255 to 408 mm.
55054 U.S.N.M. Honolulu. *Albatross* collections. 5 examples. Length, 212 to 290 mm.
55438 U.S.N.M. Honolulu. Jordan and Evermann. Length, 220 mm.
55481 U.S.N.M. Honolulu. Fur Seal Commission. Length, 235 mm.
56029 U.S.N.M. Luzon. Philippine Commission. Length, 353 mm.
56136 U.S.N.M. Luzon. Philippine Commission. Length, 216 mm.
56143 U.S.N.M. Luzon. Philippine Commission. Length, 80 mm.
57990 U.S.N.M. Zamboanga. Major E. A. Mearns. 4 examples. Length, 265 to 290 mm.
59010 U.S.N.M. Bacon. Bureau of Fisheries. 1 example. Length, 178 mm.
65458 U.S.N.M. Cook Bay, Easter Island. *Albatross* collection. 2 examples. Length, 386 to 407 mm.
71839 U.S.N.M. Nafa, Okinawa. *Albatross* collection. 2 examples. Length, 164 to 178 mm.
9311 A.N.S.P. Hawaiian Islands. Dr. J. K. Townsend. Length, 252 mm.
9312 to 9314 A.N.S.P. Oahu. Dr. W. H. Jones. Length, 125 to 212 mm.
28150 to 28154 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 248 mm.
33302 and 33303 A.N.S.P. Bacon. Bureau of Fisheries. Length, 193 to 220 mm.

Genus CIRRHILABRUS Schlegel

Cirrhilabrus Schlegel, Fauna Japon. Poiss., pts. vii–ix, 1845, p. 167. Atypic. Type *Cirrhilabrus temminckii* Bleeker, affixed by Bleeker Verh. Batav. Genoots., vol. 25, (Jap.), 1852, p. 17.
Cheilinoides Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 71. Type *Cheilinoides cyanopleura* Bleeker, monotypic.

Body compressed, oblong. Teeth uniserial. Canines $\frac{6}{2}$ in front of jaws, none posterior. Preopercle serrated. Scales large, 20 to 25 in lateral line. Cheeks and opercles scaled. Lateral line interrupted. Dorsal spines 11, rays 9. Anal spines 3, rays 9. Ventrals short or elongate.

East Indies and Japan.

ANALYSIS OF THE SPECIES

a^1. Cirrhilabrus. Ventrals produced more than half body length; scales behind depressed pectoral without black edges ..... **temminckii.**
a^2. Cheilinoides. Ventrals not produced; scales behind depressed pectoral with black edges ..... **cyanopleura.**

CIRRHILABRUS TEMMINCKII Bleeker

Cirrhilabrus temminckii Bleeker, Verh. Batav. Genootsch., vol. 25 (Jap.), 1852, p. 17. Nagasaki.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 124 (copied).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 651, fig. 10 (Wakanoura, Japan).

Depth 3; head $2\frac{7}{8}$ to 3, width 2 to $2\frac{1}{4}$. Snout $3\frac{7}{8}$ to 5; eye $3\frac{7}{8}$ to 5. equals or greater than snout, $1\frac{1}{6}$ or more in interorbital; maxillary reaches $\frac{3}{4}$ to eye, length $3\frac{3}{4}$ to $4\frac{1}{4}$ in head; interorbital $3\frac{1}{3}$

to 3⅞, broad, slightly convex; hind preopercle edge minutely dentate. Gill rakers 9+7, short, lanceolate.

Scales in lateral line 16 or 17+4 or 5+2; 4 scales above lateral line, 6 below, 5 predorsal; 2 rows of cheek scales. Scales with 11 or 12 basal radiating striae, apical 30 or 31; circuli fine.

D. XI, 9, 1, ninth spine 2 1/10 to 2½ in head, first ray 2 1/10 to 2⅓; A. III, 9, 1, third spine 3 to 3⅛, first ray 2½ to 2⅔; caudal 1⅕ to 1¼, convex behind; least depth of caudal peduncle 2⅛ to 2⅙; pectoral 1⅔ to 1½; ventral 1½ to 3 in combined head and body.

Body pale brownish generally, pale or whitish below. Broad, slightly paler band from side of snout to bases of lower median caudal rays. Iris pale yellowish. Dorsals and anals pale or transparent grayish, basally deep brownish. Caudal uniform. Paired fins pale or very light brownish, with slight dusky spot at origin of fin.

Females show 6 whitish blotches along upper edge of back and deep brown blotch about size of pupil on upper hind portion of caudal peduncle. Back also with many longitudinal whitish lines, more or less broken or irregular. Lower side specked and mottled with whitish.

Japan.

A brilliant little fish, reaching 100 mm., the sexes colored differently and the very long ventrals extending to or little beyond the anal base.

D. 5145. 2 examples, Jolo. February 15, 1908. Length, 51 to 92 mm. [90.]
Near D. 5148. Sirun Island. Taken from the stomach of large serranids bought of native fishermen. February 16, 1908. Length, 55 mm.

CIRRHILABRUS CYANOPLEURA (Bleeker)

Cheilinoides cyanopleura Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 72, pl. 1. Batavia.

Cirrhilabrus cyanopleura Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 76, pl. 23, fig. 1 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 124 (compiled).—Weber, Zool. Forsch. Austral. Ritter Semon, vol. 5, 1895, p. 272 (Amboina).

Cirrhilabrus lyukyuensis Ishikawa, Proc. Dep. N. H., Imp. Mus., Tokyo, vol. 1, 1904, p. 12, pl. 4, fig. 1. Nafa, Okinawa.

Depth 3 to 3⅛; head 3⅕ to 3¼, width 2 to 2⅕. Snout 3⅞ to 4; eye 4 to 4½, 1 to 1⅙ in snout, 1⅕ to 1½ in interorbital; maxillary reaches ⅘ to eye, length 4⅕ to 4⅔ in head; canines ⅔, upper flaring outward; interorbital 3⅙ to 3¾, convex. Gill rakers 5+10, lanceolate.

Scales in lateral line 15 to 17+6 or 7+1 or 2; 2 scales above lateral line, 6 below, 6 predorsal; 2 rows of cheek scales, preopercle flange naked. Scales with 11 to 16 basal radiating striae, 30 to 32 apical; circuli very fine.

D. XI or XII, 8, 1 or 9, 1, eleventh spine 2⅔, eighth ray 1¾ to 2; A. III, 8, 1 or 9, 1, third spine 3⅖ to 3⅔, eighth ray 1⅔ to 2; caudal

1 to 1¼, convex behind, often obtusely triangular; least depth of caudal peduncle 2 to 2¼; pectoral 1¼ to 1½; ventral 1$\frac{1}{10}$ to 1¾.

Olive above, each scale on trunk and tail above with 1 to 3 gray or blue dots. Row of gray blue dots around lower eye edge and others on opercle and post-ocular. Lower surface of head and body pale buff. Behind end of depressed pectoral edge of each scale, within dark upper color, with neutral dusky broadly for extent of 4 or 5 rows of scales. In some examples this darkened area extends forward nearly opposite front of spinous dorsal. Spinous dorsal and pectoral buff, fins otherwise bottle green basally, rays basally malachite green. Green tinge along abdominal edge extends little forward from vent. Pectoral with green bar across base, and neutral dusky tinge at origin of fin. Iris pale yellowish brown.

East Indies and Philippines.

The short account and figure of *Cirrhilabrus lyukyuensis* Ishikawa is evidently the same as the present species. The ventrals reach the anal. Length, 118 mm.

[2046.] Apo Island. August 19, 1909. Male. Length, 111 mm. (Dr. 5536.)

21438 Panpan Point, Tara Island. September 20, 1909. Length, 107 mm. [1964.] Top of head and nape dark olive, somewhat slaty immediately behind, thence on lateral line row and one above in center of scales olive, margins purplish; beginning slightly in advance of dorsal axil, each of rows with small reddish spot at base of each scale; on middle of side purplish border very broad, base of scale reddish, reddish predominating posterior on second lateral line row and row below; olive of anterior region runs downward to level of lower base of pectoral, below white with slight cream wash; from midway between base of ventrals and anal median line purplish, purple running along base of anal and lower caudal peduncle; breast slightly dusky, lower head more or less olive, dash of purple behind chin and on branchiostegal membrane crossing isthmus. Dorsal pale scarlet terminally; tips of spines scarlet, membrane immediately under hyaline, then bright scarlet line bordering general scarlet area; through middle of first five membranes double scarlet line with pale interval, below lemon yellow, some slaty at base of spines; scaled portion of dorsal base purplish, undulating narrow scarlet lines continue through center to posterior of soft fin; interval between to margin yellowish, mottled with hyaline, limited by very narrow scarlet line; extreme tips of rays hyaline, basal half of posterior dorsal scarlet with hyaline mottling. Caudal rays indigo, membranes yellow toward margin of lobes and terminally orange near center. Anal with hyaline margin, body of fin yellowish with hyaline mottling, tips of scaled portion blue, basal part purplish. Ventral rays blue, produced portion vermilion. Pectoral hyaline pink, with dusky bar across fleshy base.

21013. Limbe Strait, Celebes, Dutch East Indies. November 10, 1909. Length, 80 mm.

4 examples, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 70 to 81 mm. [2098.] Top of head and anterior portion of body slaty gray, becoming buff on top of head; lower surface very pale buff; from anterior spine of dorsal diagonally downward to near tip of extended pectoral scales with indigo margin, margins become narrower posteriorly to base of caudal and obsolete on lower half of first row below posterior lateral line. Dorsal scarlet

terminally, distinctly bright scarlet inframarginal line, tips beyond almost white, scales of entire fin pale indigo; rays similar, membranes of soft portion scarlet, mottled with pale, becoming somewhat yellowish under bar. Caudal rays blue, membranes very pale reddish mottled with hyaline, slightly yellowish at tips of lobes. Anal spines blue, scales similar, but showing purplish bar at base of fin; membranes hyaline, with slight yellowish shade mottled paler. Ventral rays pale bluish. Pectorals hyaline pink, dusky at upper base. Iris bluish and very pale golden.

11 examples. Gane Road. December 13, 1909. Length, 70 to 93 mm.

Genus PSEUDOCHEILINUS Bleeker

Pseudocheilinus Bleeker, Proc. Zool. Soc. London (December 10), 1861, p. 409. Type *Cheilinus hexataenia* Bleeker, monotypic.

Body oblong, compressed. Head attenuated. Eye small. Upper front canines large, flare out and backward. No hind canine. Preopercle entire. Scales large, 23 to 29 in lateral line, which interrupted. Cheeks and opercles with large scales, 2 rows on former. Dorsal with 9 subequal spines, rays 11. Anal with 3 spines, median longest, rays 9.

One species, in the Indo-Pacific.

PSEUDOCHEILINUS HEXATAENIA (Bleeker)

Cheilinus hexataenia Bleeker, Act. Soc. Sci. Ind. Néerl. (Amboina), vol. 2, 1857, p. 4. Amboina.

Pseudocheilinus hexatenia Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 73, pl. 23, fig. 2 (Amboina, Goram).—Günther, Cat. Fish. Brit. Mus. vol. 4, 1862, p. 134 (East Indies).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 557 (Koseir, Red Sea).—Sauvage, Hist. Nat, Madagascar, Poiss., 1891, p. 455, pl. 51*b*, fig. 2 (types of *Cossyphus echis* Guichenot).—Steindachner, Abhandl. Senckenberg. Ges., vol. 25, 1900, p. 441 (Ternate).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 366 (Solor, Borneo Bank, Karkaralong Island).

Pseudocheilinus psittaculus Kner and Steindachner, Sitzs. Akad. Wiss. Wien, vol. 54 (1), 1866, p. 376, fig. 7. Phoenix Islands, Polynesia.

Cossyphus echiis Guichenot, Nouv. Arch. Mus. Hist. Nat. Paris, vol. 5, 1869, p. 197, pl. 12, fig. 5. Madagascar.

Pseudocheilinus octotaenia Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 64, fig. 22. Honolulu.

Pseudocheilinus evanidus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 192. Hilo, Hawaii.—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 231 (Seychelles, Amirante).

Depth 2⅗ to 2⅔; head 2⅗ to 2⅔, width, 2⅕ to 2⅓. Snout 2¾ to 3⅛; eye 3⅖ to 4⅛, 1⅛ to 1½ in snout, equals interorbital; maxillary reaches ⅔ to ¾ to eye, 2¾ to 3⅘ in head; interorbital 3¾ to 4⅛, convex; hind preopercle edge minutely serrate. Gill rakers 2+8, short feeble points.

Scales in lateral line 15 to 18+4 or 5 (or 2+6)+2; 2 scales above lateral line, 7 below, 5 predorsal. Scales with 9 to 17 basal radiating striae, apical 13 to 32; circuli fine.

D. IX, 11, 1, ninth spine 2⅛ to 2⅞ in head, first ray 2 to 2¾; A. III, 9, 1, second spine, 2$\frac{1}{10}$ to 2¼; first ray 2⅛ to 2¼; caudal 1⅓ to 1⅔; least depth of caudal peduncle 2 to 2⅔; pectoral 1½ to 1$\frac{3}{5}$; ventral 1⅞ to 1$\frac{9}{10}$.

In alcohol largely blue green, especially soft vertical fins. Back with 6 pale gray green longitudinal stripes or lines, much narrower than darker interspaces and converging forward on head. Cheek and under surface of head very pale brown, finely or minutely dotted with white. Several darker bars cross yellow iris. Dusky longitudinal band on dorsals and anals. Small round black ocellus at origin of caudal above. Paired fins blue green.

Other examples, evidently females, differ in having head largely blue green, without converging dark bands above, cheeks and opercles uniform pale brown. Body, except head, with 6 or 7 pairs of deep brown lines, intervening bands paler, on abdomen whitish. Dark dots scattered in dark lines in some examples. Vertical fins and ventrals more deep bluish, latter black terminally.

Widely distributed from the Red Sea to the East Indies, Phoenix Islands, Tahiti and Hawaii. Several nominal species have been described, more or less based on the changed colors of preserved specimens.

1 example, Galera Island. Length, 36 mm.

[1975.] Gondra Island near Balipongpong Island. September 20, 1909. Length, 56 mm. Alternate blue and orange stripes from behind eye to base of caudal; two last beginning behind head; lower side of head pink, belly similar, breast with blue shade. Blue and orange stripes continued on dorsal, terminal portion somewhat orange; soft fin hyaline. Caudal emerald, small black speck in upper base. Anal with terminal portion of membrane pale reddish and its base blue. Ventrals blue. Pectorals hyaline.

[2017.] Mabul Island. September 29, 1909. Length 48 mm. Pale purplish with fine white line as stripes, two or three on each scale row. Head pale pearly, with white stripe under eye nearly to angle of preopercle, tip of snout red. Dorsal spinous membranes orange with crimson tips, soft dorsal hyaline. Caudal and anal body color, paired fins same but paler.

21968. Murcielagos Bay. August 9, 1909. Length, 58 mm.

2039. Talisse Island. November 9, 1909. Length, 53 mm.

[2094.] 1 example, Gane Road, Gillolo Island, Dutch East Indies. December 1, 1909. Length, 45 mm. Dull wine red with narrow sulphur stripes. Dorsal spines indigo, membranes hyaline wine, rays slightly dusky. Caudal rays pale indigo, membranes hyaline pink. Anal same as dorsal. Ventral spines indigo, indigo blotch across outer half of fin, tip pink. Pectoral hyaline pink. Iris scarlet.

17989 U.S.N.M. Honolulu. Dr. T. H. Street. Length, 103 mm. 1 example.

51059 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 109 to 128 mm. 2 examples.

50678. U.S.N.M. Hawaiian Islands. Mitchitaro Sindo. Type of *Pseudocheilinus evanidus*.

52417 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 38 to 60 mm. 5 examples.

55187 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 63 mm. 1 example.

55186. U.S.N.M Hawaiian Islands. Bureau of Fisheries. Length, 37 to 76 mm. 10 examples.

9667 to 9673. A.N.S.P. Tahiti. Andrew Garrett. Length, 34 to 44 mm.

Genus CHEILINUS Lacépède

Cheilinus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, p. 529. Type *Cheilinus trilobatus* Lacépède, designated by Bonaparte, Fauna Italica, Pesc., vol. 1, 1841, fasc. xxx.

Cheilinas Duméril, Zool. Analyt., 1806, p. (126) 333. Type *Cheilinus trilobatus* Lacépède.

Chilinus Peters, Arch. Naturgesch., 1855, p. 264. Type *Cheilinus trilobatus* Lacèpéde.

Urichthys Swainson, Nat. Hist. An., vol. 2, 1839, p. 224. Type *Labrus lunulatus* Forskål, designated by Swain, Proc. Acad. Nat. Sci. Phila., 1882, p. 274.

Crassilabrus Swainson, Nat. Hist. An., vol. 2, 1839, p. 225. Type *Cheilinus undulatus* Rüppell, monotypic.

Thalluirus Swainson, Nat. Hist. An., vol. 2, 1839, p. 230. Type *Crenilabrus blochii* Swainson, monotypic.

Oxycheilinus Gill, Proc. Acad. Nat. Sci. Phila., 1862, p. 143. Type *Cheilinus arenatus* Valenciennes, monotypic.

Body oblong, compressed. Snout large, often elongate. Lips thick. Teeth uniserial. Canines $\frac{1}{2}$, erect, no hind canines. Scales large, 20 to 25 in lateral line. Cheeks with 2 rows of scales. Opercles scaled. Lateral line interrupted. Dorsal spines 9 or 10, subequal, rays 10. Anal spines 3, rays 8.

Large, deep-bodied fishes of the Indo-Pacific, usually variegated with deep red and green.

ANALYSIS OF THE SPECIES

a[1]. Cheilinus. Dorsal spines 9.

b[1]. Cheek scales cover, at least in part, lower preopercle flange; basal dorsal and anal scales usually elevated.

c[1]. Preopercle flange below entirely covered by cheek scales.

d[1]. Head obtuse; head with yellow or red lines and bars; uppermost caudal rays produced, sometimes median also; size small. **bimaculatus.**

d[2]. Head more pointed; head without spots or bands; caudal rays not produced; size rather small **oxycephalus.**

c[2]. Preopercle flange only partly covered with scales of cheek; head obtuse, with spots and lines of red, but no lines on postocular; size rather large **trilobatus.**

b[2]. Preopercle flange naked; head with lines or vermiculations.

e[1]. Head and body deeper, more robust.

f[1]. Body with 6 broad, dark, transverse bands; no black lines from eye; size moderately large **fasciatus.**

f[2]. Body without transverse bands, each scale with 1 or more transverse or vertical red lines; 2 parallel black lines before eye and 2 shorter postocular; size very large **undulatus.**

e^2. Head and body more slender, former pointed.
g^1. Soft vertical fins not variegated with darker.
h^1. Lower side of head with 8 or 9 blackish lines inclined backward ..... **diagramus.**
h^2. Gray or reddish lines, more or less radiating from eye. **unifasciatus.**
g^1. Soft vertical fins greenish, ribbed with dusky; muzzle attenuate ..... **rostratus.**
a^2. THALLIURUS. Dorsal spines 10; brown with reddish spots; vertical fins and ventrals with yellow spots ..... **chlorurus.**

CHEILINUS BIMACULATUS Valenciennes

Cheilinus bimaculatus VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 96. "Onarourou" (Honolulu).—JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1403 (1905), p. 320, pl. 38 (Honolulu and Hilo).

Cheilinus ceramensis BLEEKER, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 290. Wahai, northern Ceram.—BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 62, pl. 28, fig. 4 (Bali, Solor, Timor, Amboina, Ceram, Banda).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 127 (Amboina and Aneiteum).—MARTENS, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina).—REGAN, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 230 (Maldives, Seychelles).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 16, 1913, p. 130 (Ambon).

Chilinus ceramensis GÜNTHER, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 245 (Zanzibar and Aneiteum).

Depth 2⅞ to 3; head 2⅔ to 2⅞, width 2¼ to 2⅓. Snout 3⅛ to 3⅙ from snout tip; eye 4½ to 4⅔, 1½ to 1⅗ in snout, 1 to 1¼ in interorbital; maxillary 3⅛ to 3⅓ in head, reaches to eye; interorbital 4⅕ to 4⅘, convex. Gill rakers 5+5, short.

Scales in lateral line 12 to 15+5 to 7+2; 2 scales above lateral line, 5 or 6 below, 6 or 7 predorsal. Scales with 12 to 14 basal radiating striae, apical 15 to 20; circuli very fine.

D. IX, 10, 1, ninth spine 2¼ to 2¾ in total head length, seventh ray 1⅔ to 2⅗; A. III, 8, 1, third spine 2⅕ to 2½, seventh ray 1⅖ to 2; least depth of caudal peduncle 2⅕ to 2⅖; pectoral 1¾ to 2⅛; ventral 1⅕ to 1⅖; caudal with upper and median rays produced, 1⅞ to 2⅖ in combined head and body or long as head in young.

Back chocolate or vandyke brown, sometimes sides more or less walnut brown. Below lateral line scales on middle of side all more or less edged dusky and often with several obsolete dark blotches, sometimes these only as 1 or several very dusky scattered scales though then all in same level or within same row of scales. Lower sides and under surface wood brown to isabella color, uniform. Neutral dusky postocular spot not larger than pupil, edged pale yellow. Also 2 pale yellow lines radiate from eye toward snout tip, 2 below to rictus, 3 behind across upper cheek, and 3 rather imperfect or broken above into interorbital. Fins pale buff. At front of spinous dorsal dusky black blotch. Often soft dorsal more or less

pale to whitish and uniform posteriorly. Pectoral neutral greenish, finely specked or with fine waved lines of gray. Iris grayish.

East Indies, Melanesia, Hawaii. A comparison of Bleeker's figure and description of *Cheilinus ceramensis* do not reveal any characters to accept it as a distinct species.

1 example, Cataingan Bay, Masbate. April 18, 1908. Length 80 mm.

22657. Cataingan Bay, Masbate. Length, 104 mm. [573.] Top of head and back dark green, lower half of side olive gray; breast and belly washed with greenish yellow; upper portions variously mottled with brownish; on nape and anterior side more or less definite spots at bases of scales; brick red lines radiating from eye; throat and lower head variously marked with geranium red lines. Dorsal anteriorly body color, margined with reddish, posterior portion yellow; the entire fin marked with reticulating reddish lines. Caudal body color, marked with reticulating lines of brick red, becoming brighter near tip of upper lobe, except produced ray; black margin of lower lobe darker. Anal similar to caudal, margin darker. Ventral greenish, specked with red. Pectoral hyaline pink, yellow at base. Iris green.

22390. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 67 mm.

22593. Canmahala Bay. March 11, 1909. Length, 83 mm.

1 example, Cebu market. March 28, 1909. Length, 94 mm.

20284. Cotabato, Mindanao. March 20, 1908. Length, 60 mm.

1 example, Pandanon Island. March 24, 1909. Length, 95 mm. [1459.] Snout pale greenish gray, body dark gray, with more or less green shade; red lines radiating from eye and red areas covering center of scales on nuchal region; on side dusky areas at base of scales and pale specks on central region. Dorsal pale olivaceous, much reticulated with red and specked with reddish. Caudal pale green, with fine reticulation of reddish brown. Anal similar. Ventrals and pectorals very pale hyaline pink, base of latter yellow.

1 example, Pandanon Island. March 24, 1909. Length, 115 mm. [Dr. 5405.] [1442.] Dark viridian on top of head, becoming grayish on back; chin and upper lip pale green; throat and breast greenish yellow; cheek and lower opercle geranium; reddish lines radiate from eye across preorbital; interorbital region spotted with reddish; similar spots on nuchal region but much darker, becoming blackish claret; through middle of side from eye a band of darker than greenish on head, becoming black blotches on posterior body, continuing as dark shade in center of caudal. Dorsal green, anterior membranes dusky, first with bright blue spot occupying most of its area; tip of first ray bright red, continuing as marginal line, but paler, through entire fin; fine reticulation of reddish through terminal portion of fin, most marked posteriorly, where body color becomes cadmium yellow. Caudal bright green, with reticulation of red lines, which become prominent color on angular margins of lobes. Anal similar to caudal, body pale green, reticulation of red becoming close along margin, where interspace more or less bluish. Ventrals somewhat similar to anal. Pectorals pale hyaline pink, base bright yellow.

17251, 17252, 17261, 17263. Pandanon Island. March 24, 1909. Length, 93 to 115 mm.

5 examples, Pandanon Island. March 29, 1909. Length, 57 to 90 mm.

1 example, Pandanon Island. May 24, 1909. Length, 111 mm.

1 example, Philippines. February 21, 1908. Length, 95 mm. D. 5159.

4441. Philippines. February 24, 1908. Length, 55 mm. Dr. 5163.

1 example, Philippines. March 5, 1908. Length, 32 mm. P. 5174, Dr. 5517.

20934. Surigao, Mindanao. May 8, 1908. Length, 70 mm.

Wiss. Berlin, vol. 1, 1877, p. 26 (Red Sea).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 244, pl. 131 (East Africa, Fiji, New Hebrides, Samoa, Society Islands, Gilbert Islands, Howland, Ponápe, Futuna).—Day, Fauna British India, vol. 2, 1889, p. 398.—Picaglia, Atti. Soc. Nat. Modena, ser. 2, vol. 12, 1893, p. 33 (Assab, Red Sea).

Cheilinus sinuosus Quoy and Gaimard, Voy. Uranie, Zool., November 20, 1824, p. 278. Madagascar.

Cheilinus abudjubbe Rüppell, Neue Wirbelth. Fische, 1835, p. 18 (on *Cheilinus trilobatus* Rüppell).

Cheilinus rivulatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 86. New Ireland.

Cheilinus polygramma Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 103. Ulea.

Cheilinus maculosus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 104. Oualan.

Cheilinus nebulosus Richardson, Proc. Brit. Assoc. Adv. Sci. (Ich. China and Jap.), 1846, p. 261. Sea of China.

Cheilinus tetrazona Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 293. Priaman, Sumatra.

Cheilinus pulchellus Sauvage, Bull. Soc. Philomath. Paris, ser. 7, vol. 4, 1879, p. 224. Fiji.

Depth 2¼ to 2⅔; head 2½ to 2⅔, width 2⅕ to 2¼. Snout 2⅗ to 3⅞; eye 4 to 7, 1⅛ to 2⅗ in snout, 1⅕ to 2 in interorbital; maxillary reaches ⅔ to ¾ to eye, 2⅞ to 3⅗ in head; interorbital 3½ to 4¼, convex. Gill rakers 4+6, short, robust, lanceolate.

Scales in lateral line 14 to 16+6 or 7+2, tubes arborescent; 2 scales above lateral line, 6 below, 6 predorsal. Scales with 13 to 15 basal radiating striae, auxiliaries 11 with age; marginals and apicals 42 to 72, with many as 10 auxiliaries; circuli very fine.

D. IX, 10, 1, ninth spine 3¼ to 4 in head, fifth ray 1¾ to 2½; A. III, 8, 1, third spine 3 to 3$\frac{1}{10}$, fourth ray 1⅗ to 2¼; caudal 1 to 1½, cuneate behind with median rays longest, though upper and lower with extended points; least depth of caudal peduncle 1⅞ to 2$\frac{1}{10}$; pectoral 1$\frac{9}{10}$ to 2⅕; ventral 1⅓ to 1⅔.

Brown, with 3 or 4 transverse obsolete darker bands, ill-defined and last across side of caudal peduncle. Head spotted with whitish and streaks on snout same towards eye. Each scale on body with grayish or whitish vertical line. Fins brownish, vertical fins largely with pale greenish. Dorsals and anals each with 2 submarginal dark lines. Pectoral pale brown. Ventral greenish.

East Africa to the East Indies, Japan, Samoa, and the Society Islands. A large handsome species. The young resemble *Cheilinus chlorurus*, but are without the pale spots of that species. Most all our series obtained with dynamite.

5682 and 7684. Agojo Point, Catanduanes Island. June 10, 1909. Length, 143 to 198 mm.

9290. Biri Channel. June 1, 1909. Length, 122 mm.

8672. Biri Channel. June 25, 1909. Length, 196 mm.

16869. Bisucay Island. April 9, 1909. Length, 170 mm.
8343. Buang Bay, Talajit Island. March 15, 1909. Length, 334 mm.
6309, 7818, 12457. Bugsuk Island, Balabac. January 5, 1909. Length, 135 to 260 mm.
8794. Butauanan Island. June 1, 1909. Length, 317 mm.
7200. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 212 mm.
13025 and 13026. Cataingan Bay. April 17, 1908. Length, 142 to 166 mm.
5313 and 5710. Cebu market. April 4, 1908. Length, 153 to 243 mm.
8990 and 18986. Gubat Bay, Luzon. June 23, 1909. Length, 205 to 278 mm.
11089. Inamucan Bay, Mindanao. August 8, 1909. Length, 165 mm.
13342. Langao Point, Luzon. June 24, 1909. Length, 165 mm.
20922 and 22239. Little Santa Cruz, Zamboanga. May 26, 1908. Length, 158 to 173 mm.
8303. Lode Bay, Destacado Island. March 2, 1909. Length, 342 mm.
19201. Maagnas, Lagonoy Gulf, Luzon. June 7, 1909. Length, 148 mm.
5406. Mactan Cove, Mactan Island. April 6, 1908. Length, 253 mm.
8445. Mactan Island. March 25, 1909. Length, 333 mm.
8818. Maculabo Island. June 13, 1909. Length, 327 mm.
21618. Makesi Island, Palawan. April 5, 1909. Length, 156 mm.
6203. Malapascua Island. March 16, 1909. Length, 148 mm.
9086. Malhon Island. July 27, 1909. Length, 235 mm.
6182 and 6183. Mansalay Island, Mindoro. June 4, 1908. Length, 217 to 270 mm.
17455. Murcielagos Bay, Mindanao. August 10, 1909. Length, 125 mm.
4688. Nasugbu Bay. January 16, 1908. Length, 170 mm.
17798. Palag Bay, Luzon. June 16, 1909. Length, 158 mm.
1 example, Philippines. Length, 295 mm.
5755. Port Capunuypugan, Mindanao. May 10, 1908. Length, 243 mm.
6546 and 11037. Port Maricaban. July 21, 1908. Length, 150 to 328 mm.
5084. Pujada, Mindanao. May 15, 1908. Length, 170 mm.
8788, 8789. Quinalasag Island. June 1, 1909. Length, 227 to 265 mm.
8975. Rapurapu Island and Strait. June 22, 1909. Length, 295 mm.
7391. Romblon Harbor. March 25, 1908. Length, 143 mm.
8704. San Miguel Island. June 4, 1909. Length, 371 mm.
5721 and 9403. Surigao, Mindanao. May 8, 1908. Length, 135 to 306 mm.
5813 and 5814. Tataidaga Point, Pujada Bay, Mindanao. May 15, 1908. Length, 222 to 262 mm.
6424 and 10451. Tilig, Lubang Island. July 14, 1908. Length, 116 to 210 mm.
12547 to 12551, 12554, 13861. Apra Bay, Guam. November 19–20, 1907. Length, 62 to 150 mm.
A1547, A1573. Nan Wan Bay, Formosa. January 25, 1910. Length, 228 to 300 mm.
19945 U.S.N.M. Mauritius. Col. N. Pike. Length, 203 to 305 mm. 9 examples.
52349 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. 1 example. Length, 175 mm.
52422 U.S.N.M. Apia. Bureau of Fisheries. Length, 180 to 287 mm. 8 examples.
58035 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Length, 190 mm. 1 example.
71678 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Length, 152 to 170 mm. 4 examples.
84216 U.S.N.M. Philippines. Dr. F. Baker. Length, 320 mm. 1 example.

32216 and 32217 A.N.S.P. Pago Pago. Bureau of Fisheries. Length, 158 to 228 mm.

27725 to 27727 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller Length, 158 to 280 mm.

CHEILINUS FASCIATUS (Bloch)

Sparus fasciatus Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 18, pl. 257. Japan.—Shaw and Nodder, Nat. Miscellany, vol. 18, 1806, pl. 755 (Indian Seas).

Cheilinus fasciatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 92 (Mauritius, Seychelles, Batavia, Moluccas).—Rüppell, Neue Wirbelth., Fische, 1835, p. 18 (Red Sea).—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 67, pl. 26, fig. 2 (Java, Duizend Islands, Sumatra, Singapore, Nias, Celebes, Flores, Amboina, Banda, Goram).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 129 (Amboina).—Kner, Reise Novara, Fische, vol. 2, 1865, p. 251 (Java).—Günther, Fishes of Zanzibar, 1866, p. 89 (Zanzibar).—Day, Fishes of India, pt. 3, 1877, p. 394, pl. 84, fig. 1 (Malay Archipelago).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Macassar, Cebu, Mysore, New Guinea).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 550 (C. de Cebu).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 93 (Bacon).—Weber, Abhandl. Senckenberg. Ges., vol. 34 (1), 1911, p. 8 (Kei Island).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 364 (Salibabu and Feer).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 51 (Cebu).

Chilinus fasciatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 555 (Koseir, Red Sea).—Günther, Cruise of Curacoa, Brenchley, 1873, p. 410 (Solomons); Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 246, pl. 134 (East Indies, Solomons, Pelew Islands, Gilbert Islands, Vavau, Ponape).—Day, Fauna British India, vol. 2, 1889, p. 399.

Labrus enneacanthus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 433, 480. No locality.

Cheilinus enneacanthus Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 539 (Padang).

Cheilinus quinquecinctus Rüppell, Neu. Wirbelth. Fische, 1835, p. 19, pl. 6, fig. 1. Djedda.

Cheilinus nigropinnatus Seale, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 86. Guam.

Depth 2⅓ to 2⅖; head 2⅖ to 2⅔, width 2 to $2\frac{1}{10}$. Snout 2⅛ to 3¼; eye 4⅛ to 6⅖, 1⅕ to 3 in snout, 1 to 2⅛ in interorbital; maxillary reaches about ⅘ to eye, 3 to 3⅕ in head; interorbital 3 to 4½, convex. Gill rakers 7+6, very short points.

Scales in lateral line 14 or 15+7+2; 2 scales above lateral line, 5 or 6 below, 7 or 8 predorsal. Scales with 7 to 9 basal radiating striae, with 4 to 6 incomplete auxiliaries; apical and marginal radiating striae 28 to 32; circuli very fine.

D. IX, 10, 1, ninth spine 3 to 3⅙ in head, eighth ray 2⅕ to 2¼; A. III, 8, 1, third spine 2⅞ to 3⅕, sixth ray 1⅔ to 1⅞; caudal 1⅙ to 1¼, emariginate, convex behind when expanded; least depth of caudal peduncle 2 to 2⅛; pectoral $1^5/_6$ to $1\frac{9}{10}$; pectoral $2\frac{1}{10}$ to 2⅛.

Trunk and tail with 6 dark transverse vertical bands, each of 3 scales width, pale interspaces narrow. Pale radiating lines from eye. Sometimes vertical dusky streak on opercle posteriorly and usually 1 across ventral base. Usually some dark blotches about bases of scales above pectoral. Body most everywhere with crowded pale spots, none on paired fins. Soft dorsal with blackish terminal blotch and same basally. Caudal with hind edge broadly blackish and subbasally transverse black band. Pectoral uniformly pale. Ventral pale, with broad transverse black blotch.

Mauritius, East Africa and Red Sea, to the East Indies and the Riu Kiu Islands, Micronesia, and the Gilbert Islands.

15171. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 203 mm.
7466, 9862 and 16111. Bolalo Bay, Palawan Island. December 21, 1908. Length, 152 to 238 mm.
8676. Batan Island. June 22, 1909. Length, 87 mm.
16359. Biri Channel. January 1, 1909. Length, 89 mm.
22253. Biri Channel. June 2, 1909. Length, 90 mm.
6118. Bolinao Bay. May 10, 1909. Length, 180 mm.
19642. Bulan Island, Samales Group. September 13, 1909. Length, 74 mm.
7847 and 7848. Candaraman Island, Balabac. January 4, 1909. Length, 112 to 130 mm.
7638. Capunuypugan, Mindanao. May 10, 1908. Length, 205 mm.
12723. Casogoran, Malhon Island. July 27, 1909. Length, 137 mm.
5328 and 5329. Cebu market. April 4, 1908. Length, 201 to 316 mm.
7434. Dalaganem Island. April 8, 1909. Length, 124 mm.
15870. Danawan Island. September 26, 1909. Length, 110 mm.
7499, 9250 and 21527. Endeavor Strait. December 22, 1908. Length, 135 and 263 mm.
7368, 7376, 7377. Gigoso Island, Quinapundan Bay, Samar. July 28, 1909. Length, 95 to 278 mm.
14426. Gubat, Sorsogon, Luzon. June 23, 1909. Length, 115 mm.
5776 and 5779. Lianga Bay. May 12, 1908. Length, 240 to 290 mm. (D. 5524.)
14354. Limbones Cove. February 8, 1909. Length, 165 mm.
21028. Little Santa Cruz Island. May 28, 1908. Length, 110 mm.
16920. Makesi Island. March 3, 1909. Length, 100 mm.
13539. Makyan Island. November 29, 1909. Length, 109 mm.
12527. Malacochin Harbor, Linapacan Island. December 19, 1908. Length, 185 mm.
16157. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 107 mm.
15992. Maricaban Island. January 20, 1908. Length, 134 mm.
12147. Masamat Bay, Quinalasag Island. June 12, 1909. Length, 117 mm.
7238. Masinloc Bay, Zimbales. November 22, 1908. Length, 275 mm.
9337. Matnog Bay, Luzon. May 31, 1909. Length, 122 mm.
8067. Mompog Island, Anabayas. November 3, 1909. Length, 245 mm.
8963. Murcielagos Bay, Mindanao. August 20, 1909. Length, 157 mm.
9613. Pagapas Bay. February 20, 1909. Length, 147 mm.
6190, 8889, 15670 to 15672. Palag Bay vicinity, Luzon. June 16, 1909. Length, 95 to 256 mm.
11276 and 18815. Pandanon Island. March 23, 1909. Length, 125 and 158 mm.

13134. Polloc, Mindanao. May 22, 1908. Length, 134 mm.
18470 and 18471. Port Caltom. December 15, 1908. Length, 142 to 159 mm.
5756. Port Capunuypugan, Mindanao. May 10, 1908. Length, 343 mm.
6833 and 7415. Port Galera, Mindoro. June 9, 1908. Length, 122 to 157 mm.
6736, 16518 and 16519, 20795. Port Matalvi, Luzon. Length, 78 to 206 mm.
16711. Port Palapag. June 3, 1909, or Biri Channel June 2, 1909. Length, 210 mm.
7033 and 7034. Port San Pio Quinto, Camiguin Island. November 10, 1908.
9531 and 9532, 12107, 11577. Port Uson, west coast of Pinas Island. December 17, 1908. Length, 91 to 155 mm.
6412. Rasa Island, Mantaquin Bay. April 1, 1909. Length, 93 mm.
20054. Romblon. March 26, 1908. Length, 113 mm.
18166. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 100 mm.
16688. Surigao, Mindanao. May 8, 1908. Length, 124 mm.
14214. Taganak Island. January 7, 1909. Length, 138 mm.
22732. Talisse Island. November 9, 1909. Length, 92 to 165 mm. 2 examples.
19224. Tapiantana Island. September 13, 1909. Length, 117 mm.
6509 and 7352. Tara Island. December 14, 1908. Length, 160 to 212 mm.
4976. Tataan Island, Tawi Tawi reef. February 21, 1908. Length, 234 mm.
5810 and 5811. Tataidaga Point, Pujada Bay, Mindanao. May 5, 1908. Length, 310 to 335 mm.
10375. Tilig, Lubang Island. July 15, 1908. Length, 110 mm.
18906. Tulnalutan Island. September 9, 1909. Length, 91 mm.
7653, 16081. Ulugan Bay, Oyster Inlet. December 28, 1908. Length, 89 to 228 mm.
14512 and 14513. Ulugan Bay, Rita Island. December 29, 1908. Length, 90 to 207 mm.
22693. Gane Road, Gillolo Island, Moluccas, Dutch East Indies. December 1, 1909. Length, 135 mm.
12546 and 12555. Apra Bay reefs, Guam. November 19–21, 1907. Length, 68 to 322 mm.
56184 U.S.N.M. Luzon. Philippine Commission. 1 example, 105 mm.
84253 U.S.N.M. Cebu. Dr. F. Baker. 1 example, 240 mm.
52394 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. 11 examples. Length, 68 to 283 mm.
56997 U.S.N.M. Pago Pago. Bureau of Fisheries. 6 examples. Length, 82 to 168 mm.
71638 U.S.N.M. Nafa, Okinawa. Bureau of Fisheries. 2 examples. Length, 185 to 190 mm.
31000 to 31004 A.N.S.P. Pago Pago. Bureau of Fisheries. Length, 117 to 193 mm.
51106 A.N.S.P. Pago Pago. Capt. C. F. Silvester. Young.
27728 A.N.S.P. Padang, Sumatra. Messers. Harrison and Hiller. Length, 280 mm.

CHEILINUS UNDULATUS Rüppell

Cheilinus undulatus Ruppell, Neue Wirbelth., Fische, 1835, p. 20, pl. 6, fig. 2. Djedda, Red Sea.—Bleeker, Atlas Ichth. Ind. Neérl., vol. 1, 1862, p. 68, pl. 26, fig. 3 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 129 (copied); Fishes of Zanzibar, 1866, p. 88 (Zanzibar).—Day, Fishes of India, Suppl., 1889, p. 802 (Ceylon).

Chilinus undulatus Klunzinger, Verh. zool. bot. Ges. Wien., vol. 21, 1871, p. 552 (Koseir, Red Sea).—Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 245, pl. 133 (Red Sea, Zanzibar, Batavia, Tonga, Tahiti, Fanning Islands, Vavau, Ponapé, Paumotu, Carolines, Pelew Islands).—Day, Fauna British India, vol. 2, 1889, p. 399.

Cheilinus mertensii VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 102. Guam.

Cheilinus festivus VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 104. Oualan.

Chilinus godeffroyi GÜNTHER. Proc. Zool. Soc. London, 1871, p. 666, pl. 66. Tonga Islands.—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 36 (Cebu).—ELÉRA, Cat. Fauna Filip., vol. 1, 1895, p. 551 (Cebu).

Depth 2¼ to 2⅗; head 2¼ to 2⅗, width 2½ to 3. Snout 2 to 2⅔; eye 5 to 11, 2 to 5⅔ in snout, 1⅛ to 2¾ in interorbital; maxillary reaches ¾ to ⅘ to eye, 2⅔ to 3 in head; lips broad, thick, fleshy; interorbital 3¾ to 4½, convex. Gill rakers 7+12, lanceolate, robust.

Scales in lateral line 14 to 16+7+2 or 3; 2 scales above lateral line, 6 below, 6 predorsal. Scales with 13 to 15 basal radiating striae; 19 to 20 parallel apical striae; circuli very fine.

D. IX, 15, 1, ninth spine 3 to 4 in head, seventh ray 2⅓ to 2½; A. III, 8 1, third spine 3⅕ to 4, sixth ray 2⅖ to 2½; caudal 1⅖ to 1⅗, rounded convexly behind; least depth of caudal peduncle 2¼ to 2⅖; pectoral 2 to 2¼; ventral 2 to 2⅛.

Brownish generally, little paler below. Each scale with vertical brown streak, with pale or grayish line parallel in front and behind. Some scales below may have 3 vertical or variegated pale lines. Two blackish lines forward from eye toward end of maxillary and 2 backward toward suprascapula; also 4 pale lines radiate from eye above, between last pair short blackish line. Sides of head with obscure grayish more or less vertical line. Vertical fins pale brown, with waved dark streaks longitudinally on dorsals and anals and 8 transverse on caudal. Paired fins dull gray brown. In young color pattern more contrasted and lower side of head also spotted with deep brown.

Red Sea and East Africa to the East Indies and Oceania as far as the Paumotus. The largest labroid of the Indo-Pacific region, reaching a length of over 200 cm. (or upwards of 7 feet). Such examples often have the top of the head with a large fleshy crest or swelling, much like certain serranids (Centropristis, etc.) sparids, etc.

4957 and 7227. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 480 to 673 mm. Centers of scales with vertical purplish slate bar, bordered by olive green on either side; on anterior of dorsal region 4 bright green lines with light purplish interspaces and approaching nuchal region green breaks into rows of round spots, last scales merely bordered with slaty gray; on breast purple becomes brown, taking form of 10 narrow vermiculating lines on each scale, forming designs like Indian decorations; this character continued in broader lines at base of pectoral, edges of branchiostegal membrane, edge of gill opening and opercle; top of head dark olive, becoming paler and more bluish below; interorbital region and lower forehead with vermiculating slate blue lines; 3 dark brown lines backward from eye and 9 downward from eye across preorbital; ground-color on nose becomes dull buff chrome, forming reticulations with blue; on cheek and subopercle and mandible olive forms

ground and buff carried as vermiculating lines, becoming dull chrome and breaking into round spots below; thick lips greenish, with many bars and spots of orange. Dorsal with ground reddish brown, becoming slaty on posterior part, numerously marked with silvery green dots and short bars, in form of short wavy bars on hind part. Caudal like soft dorsal, edge tipped lemon yellow. Anal like soft dorsal. Ventral olive, yellowish wash on membranes. Pectoral olive green, tip hyaline.

1876. Cebu. August 31, 1909. Olive above, shading to yellowish green below. Scales with dark brown blotch at base, forming more or less irregular mottling over side; paler brown dashes and spots on mandible and side of head; dark brown lines through eye. Spinous dorsal and base of soft fin similar to adjacent body color; soft dorsal terminally very pale hyaline orange. Caudal yellow at tip, body of fin with dark brown recticulations enclosing olive ground. Anal like dorsal, but without yellow edge. Ventrals yellowish, obscurely mottled at base. Pectorals hyaline pink.

4895. Biri Channel. June 1, 1909. Length, 150 mm.

7470 and 7471. Bolalo Bay. December 21, 1908. Length, 248 to 310 mm.

7817. Bugsuk Island. January 5, 1909. Length, 247 mm.

17698. Busin Harbor, Burias Island. March 8, 1909. Length, 184 mm.

7853. Candaraman Island, Balabac. January 4, 1909. Length, 172 mm.

5392. Cebu market. April 7, 1909. Length, 168 mm.

6095. Cebu market. August 12, 1909. Length, 115 mm.

18805. Cebu market. August 21, 1909. Length, 113 mm. [1876.]

7562. Endeavor Strait. December 23, 1908. Length, 340 mm.

13064 and 13289. Gomomo Island. December 3, 1909. Length, 115 to 155 mm.

5330. Jolo reefs. March 6, 1908. Length, 250 mm.

8587. Matnog Bay, Luzon. May 31, 1909. Length, 265 mm.

6281. Medio Island, Mindoro. June 9, 1908. Length, 368 mm.

9302. Murcielagos Bay. August 9, 1909. Length, 322 mm.

7761. Port Ciego, Balabac. January 3, 1909. Length, 282 mm.

7315. Sablayan Bay, Mindoro. December 12, 1908. Length, 460 mm.

5583. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 310 mm.

4957. Tataan Island, Tawi Tawi Group. February 21, 1908. Length, 673 mm.

7676. Ulugan Bay, Palawan. December 28, 1908. Length, 365 mm.

7709. Ulugan Bay, Oyster Inlet. December 29, 1908. Length, 327 mm.

52487 U.S.N.M. Samoa. Bureau of Fisheries. 1 example. Length, 305 mm.

65800 U.S.N.M. Tari Tari, Gilbert Islands. *Albatross* collection. 1 example. Length, 250 mm.

65801 U.S.N.M. Rangiroa, Paumotu Islands. *Albatross* collection. 1 example. Length, 435 mm.

CHEILINUS DIAGRAMMUS (Lacépède)

Labrus digrammus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 448, 518. Great Equatorial Ocean (Indo-Pacific).

Cheilinus diagrammus Valenciennes, Hist. Nat. Poiss., vol. 16, 1839, p. 98 (East Indies, Mauritius, Seychelles, Madagascar, New Guinea).—Guichenot, Notes I. Réunion, vol. 2, 1862, p. 28.—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 267 (Romblon).—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa).

Cheilinus diagramma Guichenot, Mem. Soc. Hist. Nat. Cherbourg, ser. 2, vol. 2, 1866, p. 147 (Madagascar).

Cheilinus diagramma Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 2, 1904, p. 539 (Padang).

Cheilinus commersonii Bennett, Proc. Comm. Zool. Soc., vol. 1, 1831, p. 167. Mauritius.

Cheilinus coccineus RÜPPELL, Atlas Reise Nördl. Afr. Fische, 1828, p. 23. Djedda.

Cheilinus radiatus (not *Sparus radiatus* LINNAEUS) GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 131 (Moluccas, Amboina, northeast Australia, Louisades).—BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 68, pl. 26, fig. 1 (Java, Bali, Cocos, Sumatra, Celebes, Halmahera, Ternate, Batjan, Amboina).—BLEEKER, Ned. Tijds. Dierk., vol. 1, 1863, p. 344 (Madagascar).—GÜNTHER, Fishes of Zanzibar, 1866, p. 90 (Zanzibar).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 35 (Rubi, New Guinea).—VINCIGUERRA, Giorn. Romano Scienz. Biol., ser. 2, vol. 19, 1890, p. 486 (Zanzibar).—BORSIERI, Ann. Mus. Civ. Genova, ser. 3, vol. 1, 1904, p. 216 (Massaua and Dissei, Red Sea).

Chilinus radiatus GÜNTHER, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 247, pl. 135, fig. A (Louisades, Fiji, Samoa, Pelew Islands).

Depth 2⅔ to 2¾; head 2⅖ to 2⅔, width 2⅔ to 2⅞. Snout 2⅖ to 2⅔; eye 5⅖ to 6⅓, 2⅙ to 2⅗ in snout, 1¼ to 1½ in interorbital; maxillary reaches ⅘ to eye, 2⅗ to 2⅘ in head; interorbital 4 to 4½, convex. Gill rakers 5+10, short, lanceolate.

Scales in lateral line 15 or 16+6 or 7+2 or 3; 2 scales above lateral line, 6 below, 4 or 5 predorsal. Scales with 14 or 15 basal radiating striæ, marginal and apical radiating striæ 20 to 31, many obsolete auxiliaries with age; circuli very fine.

D. IX, 10, 1, ninth spine 3⅓ to 3⅔ in total head length, eighth ray 2⅘ to 3; A. III, 8, 1, third spine 3⅕ to 3⅔, first ray 2⅘ to 3; caudal 1⅗ to 1½, slightly double concave behind; least depth of caudal peduncle 2½; pectoral 2⅖ to 2½; ventral 2½ to 2⅔.

Brownish generally, each scale with pale basal vertical streak. Head and predorsal with buff spots and more or less longitudinal lines, variously incomplete, on upper surface. Along under side of head 8 or more blackish lines, parallel, and at opposite inclination from pale lines on upper part of head. Dorsals with spinous fin marbled with deep brown, soft fin with some pale greenish tints. Caudal largely greenish. Anal like soft dorsal. Paired fins pale brownish.

Mauritius, Madagascar, East Africa, and the Red Sea to the East Indies, Riu Kiu to Micronesia, Fiji, and Samoa.

11287, 13502. Alimango Bay, Burias Island. March 5, 1909. Length, 108 to 156 mm.

11062, 18724. Butauanan Island. June 13, 1909. Length, 154 to 190 mm.

11272, 21128, 21139, 21861. Biri Channel. June 1–2, 1909. Length, 84 to 205 mm.

18792. Bolalo Bay, Palawan Island. December 21, 1908. Length, 124 mm.

17847. Bumbum Island. September 25, 1909. Length, 110 mm.

11049. Busin Harbor, Burias Island. March 8, 1909. Length, 205 mm.

15981. Busin Harbor. April 22, 1908. Length, 183 mm.

9348. Cayayan, Sulu Island. January 18, 1909. Length, 142 mm.

5890. Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 165 mm.

16856. Cataingan Bay, Masbate. April 18, 1908. Length, 85 mm.

11182. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 129 mm.
5333. Cebu market. April 4, 1908. Length, 228 mm.
5373. Cebu market. April 5, 1908. Length, 255 mm.
17302. Gigoso Point, Quinapundan Bay. July 28, 1909. Length, 153 mm.
9726. Kayoa Island. November 29, 1909. Length, 120 mm.
9028, 10828, 16561. Langao Point, Luzon. June 24, 1909. Length, 94 to 240 mm.
22240. Little Santa Cruz, Zamboanga. May 26, 1908. Length, 132 mm.
18533. Little Santa Cruz. May 28, 1908. Length, 187 mm.
8913. Mabul Island. September 29, 1909. Length, 78 mm.
15204. Mactan Island, Cebu. March 25, 1909. Length, 222 mm.
7880. Maculabo Island. June 14, 1909. Length, 175 mm.
19664. Malaga River, Hinunangan Bay, Leyte. July 30, 1909. Length, 153 mm.
2156, 12148. Masamat Bay, Quinalasag Island. June 21, 1909. Length, 141 to 172 mm.
5555. Masbate Reef, Masbate Island. April 20, 1908. Length, 223 mm.
11349, 17633. Mompog Island, Anabayas. March 3, 1909. Length, 110 to 144 mm. [1198.]
18549. Observatory Island. December 19, 1908. Length, 135 mm.
12461 and 12462. Pagapas Bay, Luzon. February 20, 1909. Length, 150 to 173 mm. 3 examples.
11306 and 17323. Palag Bay vicinity, Luzon. June 16, 1909. Length, 131 to 187 mm.
10540, 18282. Polloc, Mindanao. May 22, 1908. Length, 102 to 135 mm.
5948. Panabutan Bay, Mindanao. February 6, 1908. Length, 203 mm.
21014. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 103 mm.
1 example, Port Caltom. December 15, 1908. Length, 60 mm.
6831. Port Galera, Mindoro. June 9, 1908. Length, 223 mm.
7419. Port Galera. June 9, 1908. Length, 170 mm.
9019. Port Jamelo, Luzon. July 13, 1908. Length, 219 mm.
19141. Port Langican, Dumaran Island. April 7, 1909. Length, 75 mm.
10470. Port Maricaban. July 21, 1908. Length, 208 mm.
12643. Port Palapag. June 3, 1909. Length, 110 mm.
21356. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 140 mm.
1 example, Romblon. March 21, 1908. Length, 112 mm. [495.]
5294. Romblon. March 25, 1908. Length, 183 mm.
5588, 11899. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 184 to 237 mm.
11899. San Miguel Harbor, Tacao Island. April 21, 1908. Length, 184 mm.
6552. San Roque. July 29, 1908. Length, 162 mm.
19559. Singaan Island. September 21, 1909. Length, 107 mm.
17664. Sitanki Reef. September 24, 1909. Length, 152 mm.
18196. Tara Island. December 14, 1908. Length, 155 mm.
10452. Tilig Lubang Island. July 14, 1908. Length, 122 mm.
18964. Tilig, Lubang. July 15, 1908. Length, 215 mm.
8682. Tutu Bay, Jolo Island, second anchorage. September, 19, 1909. Length, 100 mm.
20879. Usada. March 3, 1908. Length, 74 mm. [396.] Dark olive green, traces of three dark saddles, one under soft dorsal, one on nuchal region and one between, otherwise irregularly spotted with brick red, especially below; color appears as short bars across lower head and chin. Dorsal body color, with oblique brownish blotches across membranes, more marked in the region of the saddles; soft part posteriorly pinkish hyaline. Caudal largely lemon

yellow with irregular markings of brown and white. Anal similar to dorsal but paler. Ventral whitish, marked with red brown on inner surface of base and with slight specks of same terminally. Pectoral dusky. Iris red.

A. 1515. Birabirahan, Borneo. December 31, 1909. Length, 203 mm.

A. 1299. Uki River. December 9, 1909. Length, 250 mm.

13429. Buka Buka Island, Gulf of Tomini, Celebes. November 20, 1909. Length 122 mm.

14867. Dodepo and Pasejogo Islands, Gulf of Tomini, Celebes. November 16, 1909. Length, 84 mm.

A. 1441. Kait Point, Libani Bay, Celebes. December 28, 1909. Length, 237 mm.

21365. Limbe Strait, Celebes. November 11, 1909. Length, 140 mm.

18322. West of Malibagu Channel, Celebes. November 21, 1909. Length, 122 mm.

1 example, Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 97 mm.

A. 1067. Tidore Island. November 24, 1909. Length, 230 mm.

1 example, Tidore Island, south of Ternate. November 25, 1909. Length, 96 mm. [2071.] Rather reddish, radiating lines across lower head and behind eye. Dorsal and anal similar to body in general color, becoming hyaline posteriorly, red blotches on anal broad. Caudal yellowish, edges with body shade, reddish spots in basal portion. Base of ventrals with red blotch, its terminal half pink. Pectorals hyaline pink. Iris silvery.

18424. Nan Wan, Formosa. January 25, 1910. Length, 153 mm.

52402 U.S.N.M. Samoa. Bureau of Fisheries. 2 examples. Length, 138 to 226 mm.

71559 U.S.N.M. Nafa, Okinawa. *Albatross* collection. 1 example. Length, 164 mm. This discolored uniform dusky.

27729 A.N.S.P. Padang, Sumatra. Messrs. Harrison and Hiller. Length, 220 mm.

CHEILINUS UNIFASCIATUS Streets

Cheilinus unifasciatus Streets, Bull. U. S. Nat. Mus., No. 7, 1877, p. 82. Fanning Islands.

Cheilinus hexagonatus Günther, Journ. Mus. Godeffroy, ser. 7, vol. 15, 1881, p. 247, pl. 135, fig. *b*. Yap and Hawaiian Islands.

Cheilinus hexagonatus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23 (1), 1903 (1905), p. 319, fig. 136 (Honolulu and Hilo).

Cheilinus zonurus Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 56, fig. 13. Honolulu.

Cheilinus cingulatus Weber, Siboga Exp., vol. 57, Fische, 1913, p. 365, pl. 9, fig. 5. Binongka and Banda.

Depth 2⅞ to 3; head 2½ to 2¾, width 2⅘ to 3. Snout 2¼ to 2⅞ from snout tip; eye 4⅔ to 6⅛, 1¾ to 2½ in snout, 1 to 1½ in interorbital; maxillary reaches ¾ to ⅘ to eye, 2⅞ to 3⅛ in head; interorbital 4½ to 5¼, convex. Gill rakers 7+9, short, lanceolate.

Scales in lateral line 15+6 to 8+2; 2 scales above lateral line, 6 below, 6 predorsal. Scales with 12 to 14 basal radiating striae, 14 to 26 apical; circuli very fine.

D. IX, 10, 1, ninth spine 2⅞ to 3⅘ in total head length, seventh ray 3$\frac{1}{10}$ to 3⅛; A. III, 8, 1, third spine 2⅞ to 3⅓, first ray 2¾ to 3; caudal 1⅗ to 1⅘, convex behind; least depth of caudal peduncle 2⅖ to 2⅔; pectoral 2½ to 2⅗; ventral 2⅓ to 2⅗.

Prout's brown generally, little paler below. On trunk each scale with slightly deeper brown center, so edges little paler. A pale transverse band across front of caudal peduncle, slightly greater than scale width. Side of head with oblique indistinct grayish lines, which radiate forward from lower front eye edge and backward from lower hind eye edge. Iris pale brownish yellow. Young with two parallel longitudinal dark brown lines, upper from upper eye edge and lower from lower eye edge, back to caudal base. Fins all pale brownish or grayish. Spinous dorsal with submarginal gray line and about midway in fin another similar and parallel, both extending on front of soft dorsal.

East Indies to Hawaii. The characters given by Weber for his *Cheilinus cingulatus* do not hold and are largely individual, if not conditions of preservation. Garrett's figure of *Cheilinus hexagonatus*, as reproduced by Günther, shows 3 rows of scales on the cheek, while all of our specimens have but 2 rows. As in a number of instances Garrett's figures are incorrect.

9851. Cagayan, Sulu Island. January 8, 1909. Length, 138 mm.
12656. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 125 mm.
16959. Simaluc Island. September 22, 1909. Length, 215 mm.
21471. Doworra Island, Dutch East Indies. December 2, 1909. Length, 108 mm.
9414. Midway Island, reefs. November 7–8, 1907. Length, 175 mm.
19224 U.S.N.M. Fanning Islands. Dr. T. H. Streets. Length, 262 mm. Type *of Cheilinus unifasciatus.*
19223 U.S.N.M. Same data. 3 examples. Length, 210 to 284 mm. Paratypes.
26815 U.S.N.M. Johnston Island. Dr. D. S. Jordan. Length, 395 mm.
52720 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length, 235 mm.
28175 and 28176 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 202 to 228 mm.

CHEILINUS ROSTRATUS Cartier

Cheilinus rostratus Cartier, Verh. Ges. Würzburg, vol. 5, 1873, p. 103. Cebu, Philippines.—Elera, Cat. Fauna Filip., vol. 1, 1895, pp. 550, 557 (Cebu).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 31 (Iloilo).

Depth 2⅘ to 3⅛; head 2¼ to 2½, width 2⅘ to 3⅕. Snout 2½ to 2¾ from snout tip; eye 6, 1⅞ to 2⅓ in snout, 1 to 1¼ in interorbital; maxillary 3 to 3¼ in head, reaches ¾ to ⅘ to eye; interorbital 4⅕ to 5 in head, broadly convex. Gill rakers 3 + 9, lanceolate.

Scales in lateral line 14 to 16 + 6 or 7 + 2; 2 scales above lateral line, 6 below, 7 predorsal. Scales with 19 to 22 basal radiating striae, apical 32 to 35; circuli very fine.

D. IX, 10, I or 11, I, ninth spine 2⅔ to 3 in head, first ray 2⅕ to 2⅓; A. III, 8, I, third spine 2½ to 3, first ray 2⅕ to 2¼; caudal 1½ to 2, convex behind; least depth of caudal peduncle 2⅘ to 3; pectoral 2¾ to 2⅘; ventral 2⅓ to 3.

Back mottled darker than brown of upper surface, below paler. Bases of scales often with dark vertical bands and frequently with dark median vertical line. Back often with vermiculated dark lines, fine and close. Pale lines radiate from eye, except along its lower edge, vermiculated over top of head. Iris dull brown. Often dusky obsolete blotches along middle of side. Pectoral pale brown, other fins all more or less beryl to myrtle green, vertical ones brightest, besides finely mottled, barred or ribbed with lines of deep brown, especially on caudal. Ventral bases neutral, terminally pale beryl.

Known only from the Philippines and East Indies. Differs from *Cheilinus oxycephalus* in the variegated or dark ribbed anal, long snout, and greenish soft vertical fins. Interesting at one of the few species of the genus not known to Bleeker.

16112, 16113, 18791. Bolalo Bay, Palawan Islands. December 21, 1908. Length 69 to 173 mm.

17846 and 17848. Bumbum Island. September 25, 1909. Length, 116 to 140 mm. [1998.] Body mottled with gray, brown and whitish, paler below; few brownish lines radiating from eye; top of head and posterior part similar to body; broken end of lateral line with more dark. Dorsal olive, broken inframarginal band of scarlet, about equal to ⅓ breadth of pupil, passes along incised membranes, broad and distinct on first two or three, becoming patchy on last; dark brown spot on first and second membranes near middle; posterior portion of dorsal with hyaline membranes, rays crossed by brown bars. Caudal membranes reticulated with hyaline vermilon, enclosed areas plain hyaline; rays gray with brown spots, perhaps continuation of membrane reticulation. Anal similar to dorsal. Ventrals more or less mottled with dark brown. Pectoral hyaline pink.

8370 and 8064. Busin Harbor, Burias Island. April 22, 1908.

16666, 16681. Busin Harbor. April 23, 1908. Length, 150 to 190 mm.

15180, 15181. Busin Harbor. March 7, 1909. Length, 158 to 162 mm.

295, 7103. Busin Harbor. March 8, 1909. Length, 108 to 158 mm.

7106, 22781, 22782. Busin Harbor. May 8, 1909. Length, 71 to 112 mm.

7856 and 7857. Candaraman Island. January 4, 1909. Length, 112 to 146 mm.

21049. Capunuypugan, Mindanao. May 9, 1908. Length, 117 mm.

11647. Casogoran, Malhon Island. July 27, 1909. Length, 158 mm. [1706.] Ground color olive gray, becoming greenish on top of head and back; red lines radiating about eye, except on cheek, on which they break into spots; on upper anterior side and back numerous pale specks; belly washed with salmon, side with more or less blackish on scales, which fades; two or three blotches on axial line more or less permanent. Dorsal pale olive gray; submarginal scarlet bar about half diameter of pupil across spinous part, becoming more or less broken on soft fin; black blotch below on first membrane; body of spinous fin with red specks and pale ones similar to those on body, but smaller, reds fusing into more or less irregular black bars posteriorly and on soft fin; on latter show as downward and backward broken bars across almost hyaline posterior portion, color on rays only. Caudal rays bluish, with yellowish green joints, membranes yellowish green with reticulating bar-like network of red. Anal similar to soft dorsal, spinous membranes with reddish network; two brown blotches on bases of soft rays, crossbars more or less brownish on rays and red on membranes. Ventrals dusky orange and gray. Pectorals hyaline, with pinkish shade. Chin and throat unmarked.

4 examples, Daisy Island, west of Bumbum. January 6, 1910. Length, 45 to 108 mm.

16431. Danawan Island and Si Amil Island. September 27, 1909. Length, 138 mm.

19832. Endeavor Strait, northwest coast Palawan. December 22, 1908. Length, 135 mm.

16327 to 16330. Endeavor Strait. December 23, 1908. Length, 23 to 166 mm. 5 examples.

7371. Gigoso Point, Quniapundan Bay, Samar. July 28, 1909. Length, 102 mm. [1732.] Olive gray, much mottled and specked with whitish on nape, back, and upper side, plain gray below; 3 radiating lines from eye on preorbital, 3 above, 2 behind eye; remnants of dusky shades on median side to caudal and about 4 lighter shades, last at caudal base. First dorsal marked with black spot, orange above; ground color olive green, pale, crossed by red brown bars down and back, orange at upper ends, only dots on soft rays. Purple brown reticulation or mottling on caudal membranes, rays bluish gray. Anal like caudal, now splashed. Ventral pale, with orange and brown mottlings. Pectoral hyaline pink. Iris orange internally.

19801, 13536 to 13538. Powati Anchorage, Makyan Island. November 29, 1909. Length, 116 to 176 mm. [2087.] Dusky bottle green, bright red lines radiating about eye and mottling top of head; bases of scales with red lines on back, turning to spots on breast and belly and becoming obsolete on middle of side. Vertical fins more or less olive and abundantly mottled and specked with red, soft rays with bluish shade; dusky spot at base of first dorsal membrane, distinct yellow overlaid. [2088.] General color red; radiating lines from eye more brownish; side mottled with brown; fins slightly olive, with brown red mottling; black spot in base of first dorsal membrane; dusky through center of peduncle.

13517. Gomomo Island. December 3, 1909. Length, 150 mm.

21325. Great Tobea Island. December 15, 1908. Length, 73 mm.

2665. Jamelo Cove. July 14, 1908. Length (?). D. 5272.

13091. Kapoposang Island. December 28, 1909. Length, 143 mm.

9727, 9728. Kayoa Island. November 29, 1909. Length, 103 mm.

15979. Mactan Island, Mactan Cove, Palawan. April 6, 1909. Length 135 mm.

15020. Makesi Island, Palawan. April 5, 1909. Length, 118 mm.

17170 to 17172. Malapascua Island. March 16, 1909. Length, 73 to 110 mm,

12020. Malcochin Harbor, Linapacan Island. December 19, 1908. Length. 107 mm.

16159. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 100 mm.

7487. Murcielagos Bay, Mindanao. August 21, 1909. Length, 140 mm.

20563. Opol, Mindanao. August 4, 1909. Length, 80 to 111 mm. [1797.] General color reddish brown; lower head approaching scarlet. Dorsal mottled similar to body, but more of red than brown; black blotch before base of caudal, probably similar blotches along middle of side in life. Anal similar to dorsal and caudal. Ventral with reddish bars, broken. Pectoral plain hyaline pink.

10541 and 22485. Opol. August 4, 1909. Length, 68 to 97 mm.

12482 and 22082. Pagapas Bay, Luzon. February 20, 1909. Length, 108 to 127 mm.

11216. Paluan Bay, Mindoro. December 11, 1908. Length, 86 mm.

16897. Parang, Mindanao. May 23, 1908. Length, 145 mm.

14369. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 94 mm.

13126, 13825, 13826. Powati Harbor, Makyan Island. November 28, 1909. Length, 132 to 198 mm.

13379, 16517, 16953, 16954, 20796, 22248. Port Matalvi, Luzon. November 22, 1908. Length, 70 to 140 mm.

16456. Port Matalvi. November 23, 1908. Length, 136 mm.

12108 to 12111. Port Uson, west of Pinas Island. December 17, 1908. Length 90 to 135 mm.

13401, 20978, 20979, 22209. Rapurapu Island. June 22, 1909. Length, 99 to 129 mm.

22504. Romblon. March 26, 1908. [494.] Length, 110 to 134 mm. [476.] 3 examples. Olive green above, brownish on back, mottled with seal brown; paler below, with scale blotches of dull vermilion; 2 distinct stripes of seal brown posteriorly from eye across cheek and postorbital, continued forward indistinctly across preorbital as 3 brown lines. Dorsal body color, mottled with seal brown and dull scarlet. Anal similar, but with much less of scarlet. Caudal pale yellowish green, with transverse lines and mottlings of reddish brown. Ventral dusky, tips hyaline, more or less mottled with reddish brown. Pectoral with slight rosy wash. [493.] Similar to larger specimen but reds of lower anterior region and dorsal and anal more pronounced; general color more gray; none of green except on caudal, dorsal, and anal; fewer lines radiating from eye, possibly due to less distinct ground color. Throat rosy.

8085 and 15767. Sacol Island. September 9, 1909. Length, 119 to 140 mm.

11900 to 11903, 18163 to 18165. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 103 to 152 mm.

21292. Sebateo Island. January 2, 1909. Length, 113 mm.

6703. Singaan Island. September 20, 1909. Length, 147 mm.

19558, 19560, 21870. Singaan Island. September 21, 1909. Length, 88 to 103 mm.

19557. Singaan Island. September 22, 1909. Length, 148 mm.

9690 to 9695, 14398, 14940, 22844. Talisse Island. November 9, 1909. Length, 63 to 160 mm. 17 examples.

21906 and 21908. Tapiantana Island. September 13, 1909. Length, 161 to 178 mm.

8669. Tara Island. December 11, 1908. Length, 138 mm.

18950. Tilig, Lubang. July 15, 1908. Length, 180 mm.

12900. Tobea Island. December 14, 1908. Length, 122 mm.

20845, 20954, 20955, 20956. Tomahu Island. Length 90 to 122 mm.

7916 and 7919. Tutu Bay, Jolo, second anchorage. September, 1909. Length, 126 to 168 mm.

20694 to 20696. Ulugan Bay, near Baheli River mouth. September, 1919. Length, 95 to 148 mm.

16079. Ulugan Bay, Burias Island. December 28, 1908. Length, 118 mm.

16077 to 16079, 16080. Ulugan Bay, Oyster Inlet. December 28, 1908. Length, 100 to 148 mm.

15433 to 15435. Ulugan Bay, near Rita Island. December 29, 1908. Length, 101 to 110 mm.

20877. Usada Island. March 3, 1908.

1 example, N. Lat. 8° 48′ 44″ E. Long. 123° 27′ 35″ 12 ft. Tanner Trawl. (Off northwest Mindanao.) August 10, 1909. [D. 5523.] [2172.] Length, 153 mm.

13223. Doworra Island, Dutch East Indies. December 2, 1909. Length, 150 mm.

12924, 13430. Buka Buka Island, Gulf of Tomini, Celebes. November 20, 1909. Length, 96 to 163 mm.

21113. Cape Kait, Libani Island, Celebes. December 29, 1909. Length, 108 mm.

9507, 21431, 22368. Dodepo Island, Gulf of Tomini, Celebes. November 16, 1909. Length, 108 to 140 mm.

6 examples, Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 35 to 107 mm.

22867. Togian Bay, Togian Island, Gulf of Tomini, Celebes. November, 17, 1909. Length, 100 mm.

22824, 22868, 22869. Togian Bay. November 19, 1909. Length, 78 to 128 mm. 8 examples.

13027, 13261, 19947. Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 68 to 160 mm. 9 examples. [2095.] Scarlet and gray mottled with brownish on side; two radiating lines of brown behind eye; midpeduncle dusky; black blotch on first two dorsal membranes; tail with narrow white tip.

12940 and 12941. Tidore Island, south of Ternate. November 25, 1909. Length, 78 to 152 mm. 4 examples. [2070.] Pale gray, clouded with brownish and reddish shades; few white margins to scales along middle of side; lower parts pale, about pearl gray. Dorsal greenish and much mottled with reddish, base of first two membranes with blackish blotch. Caudal and anal similar, somewhat dusky along middle of peduncle. Ventrals pale, otherwise similar to verticals. Pectorals pale hyaline pink, without spots unless at base.

22311. Tidore Island. November 29, 1909. Length, 117 mm.

CHEILINUS CHLORURUS (Bloch)

Sparus chlorurus Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 24, pl. 260. Japan and St. Domingo.

Cheilinus chlorurus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862 p. 65, pl. 27, fig. 3 (Java, Duizend Islands, Bawean, Cocos, Batu, Nias, Singapore, Banka, Biliton, Celebes, Sangi, Timor, Ternate, Buru, Amboina, Ceram, Goram).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1864, p. 128 (Ceylon, Amboina, Ceram, Aneiteum).—Kner, Reise Novara, Fische, vol. 2, 1865, p. 251 (Singapore).—Day, Fishes of India, pt. 3, 1877, p. 393, pl. 83, fig. 6 (Andamans).—Bleeker, Verh. Ak. Amsterdam, vol. 18, No. 3, 1871, p. 1 (Mauritius).—Evermann and Seale, Bull. Bur. Fisher, vol. 26, 1906 (1907), p. 93 (Bacon).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).—Beaufort, Bijd. Dierk. Amsterdam, vol. 16, 1888, p. 129 (Saonek).—Regan, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 231 (Seychelles, Coetivy).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 363 (Samau, Macassar, Karkaralong, west coast of New Guinea, Nusa Laut Island).

Chilinus chlorurus Günther, Journ. Mus. Godeffroy, vol. 7 (15), 1881, p. 245, pl. 132 (New Hebrides, Pelew Islands, Society Islands, Tonga, Fiji, Yap, Ponape, Paumotu).—Day, Fauna British India, vol. 2, 1889, p. 398, fig. 134.—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 441 (Ternate).

Cheilinus punctatus Bennett, Proc. Zool. Soc. London, vol. 1, 1831, p. 167. Mauritius.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 127 (Mauritius).

Thalliurus blochii Swainson, Nat. Hist. An., vol. 2, 1839, p. 230 (on Bloch, pl. 260).

Cheilinus punctulatus Valenciennes, Hist. Nat. Poiss, vol. 14, 1839, p. 87, pl. 396. Seychelles.

Cheilinus sanguineus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 106. Ulea.

Chilinus punctulatus Peters, Archiv Naturg., 1855, p. 264 (Mozambique).

Cheilinus guttatus Bleeker, Verh. Batav. Genootsch. (Labr. Cycl.), vol. 22, 1849, p. 36. Batavia.

Cheilinus decaconthus Bleeker, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 256. Neira, Banda.

Cheilinus undulatus (not Rüppell) Kendall and Radcliffe, Mem. Mus. Comp. Zoöl., vol. 35, 1912, p. 141 (Mangareva).

Depth 2⅓ to 2⅗; head 2⅖ to 2⅔, width 2⅕ to 2¼. Snout 2⅞ to 3½; eye 4⅙ to 6⅖, 1⅕ to 2¼ in snout, 1 to 1⅔ in interorbital; interorbital 3⅘ to 4⅙, convex. Gill rakers 6+6, strong, short points.

Scales in lateral line 15+5 to 7+2 to 3; 2 scales above lateral line, 6 below, 7 predorsal. Scales with 11 basal radiating striae, apical 24 to 34, with very few marginals; circuli very fine.

D. X, 9, I, tenth spine 2⅖ to 3 in head, seventh ray 1⅞ to 2$\frac{1}{10}$; A. III, 7, I, third spine 2¾ to 3⅕, seventh ray 1⅗ to 2⅙; caudal 1⅕ to 1¼, rounded convexly behind, tips of each upper and lower rays exserted slightly; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅖; pectoral 1$\frac{9}{10}$ to 2; ventral 1⅛ to 1⅖.

Brown, with 3 or 4 transverse obsolete brownish bands, variously obscure. Head and trunk finely spotted or dotted with whitish, most crowded on predorsal. Pale bars or lines obliquely about cheek. Edge of opercular flap above dusky brown, with several creamy specks. Dorsal deep brownish with several submarginal longitudinal dark lines and dark reticulations, also fine white dots, posteriorly soft fin pale. Caudal pale basally, medianly dusky and greenish on outer portions, small pale dots over median area. Anals deep brown, finely dotted with grayish or whitish. Pectoral uniform pale brown. Ventral dusky brown, with fine whitish dots. Along lateral line 3 dark scales, equally spaced.

Mauritius to the East Indies and the Paumotus. Distinguished from *Cheilinus diagrammus* chiefly by the small whitish dots or spots, 1 to 4 on each scale and often forming longitudinal series. The young are variably dark and with about 4 whitish bars across lower surface of head. They always have last half of soft dorsal uniformly pale or whitish. Often the young are olive, with greenish tints on the fins and may be rather sparsely marked with small white spots over most of the body. Such individuals are without dark transverse bands, though with 2 dark median spots on the lower section of the lateral line. One whitish line down from lower front eye edge, while other examples of same size often with another white line inclined little forward or over middle of mandible. The young may also show 4 obscure transverse dusky bands on the body, usually with median dark spot in each. In some adults variation in the snout occurs, often short, though they otherwise approach *Cheilinus oxyrhynchus*. Such examples have the head

finely dotted with gray or white, also breast, belly, and abdomen, though there the dots are larger and more irregular.

20485. Batan Island. June 5, 1909. Length, 105 mm.
12399. Bolalo Bay, Palawan. December 21, 1908. Length, 175 mm.
15573. Bugsuk Island. January 5, 1909. Length, 120 mm.
16811. Butauanan Island. June 12, 1909. Length, 148 mm.
17181. Butauanan Island. June 13, 1909. Length, 170 mm.
7855. Candaraman Island, Balabac. January 4, 1909. Length, 75 mm.
16193. Cataingan Bay, Masbate. April 18, 1908. Length, 117 mm.
10697. Cataingan Bay, Dumurug Point. April 19, 1908. Length, 122 mm. (damaged).
11181. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 160 mm.
5712, 5334, 12669. Cebu market. April 4, 1908. Length, 153 to 215 mm.
19122. Chase Head, mouth of stream at village near, Endeavor Strait, Palawan. December 22, 1908. Length, 140 mm.
21108. Danawan Island and Si Amil Island. September 27, 1909. Length, 63 to 120 mm.
13816. Guijulugan, Negros. April 2, 1908. Length, 75 mm.
11088. Inamucan Bay, Mindanao. August 8, 1909. Length, 140 mm.
4865. Jolo market. February 13, 1908. Length, 250 mm.
5156. Jolo market. March 6, 1908. Length, 186 mm.
4919 and 4920. Jolo. March 7, 1908. Length, 138 to 190 mm.
4314. Mactan Island, Cebu. March 25, 1909. Length, 220 mm. D. 5420.
8968, 8970. Murcielagos Bay, Mindanao. August 20, 1909. Length, 109 to 190 mm.
12762 to 12764. North end of Endeavor Strait, northwest coast of Palawan. December 22, 1908. Length, 93 to 123 mm.
20. Pandanon Island. March 23, 1909. Length, 131 mm.
22192. Pangasinan Island. February 13, 1908. Length, 127 mm.
1 example, Pilas Island. September 12, 1909. Length, 65 mm.
22704. Port Caltom. December 15, 1908. Length, 130 mm.
17625. Port Langcan, Palawan. August 8, 1909. Length, 207 mm.
18174. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 123 mm.
18969. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 201 mm.
22222. Rapurapu Island. June 22, 1909. Length, 113 mm. [1760.]
19098. Silino Island. August 10, 1909. Length, 153 mm.
17665. Sitanki Reef. September 24, 1909. Length, 95 to 129 mm. 2 examples.
9374. Taganak Island. January 7, 1909. Length, 123 mm. [1054.] Olive green, clouded with dusky; two or three black spots through middle of side on axil line; head and nape peppered with small brick red spots; lower side with obscure small gray spots. Dorsal with red bar through tips of incised spinous membranes, broadening to cover almost all of soft dorsal, remainder of fin similar to body. Caudal body color, becoming red towards tip, peppered with gray spots. Anal somewhat similar, red showing through posteriorly. Ventrals with blackish shades. Pectorals hyaline the rays pale orange.
20595. Tilig, Lubang Island. July 14, 1908. Length, 98 mm.
18878. Tilig, Lubang. July 15, 1908. Length, 131 mm.
6168, 20740, 20741. Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 68 to 106 mm.
18253. Tumindao Island. December 11, 1909. Length, 160 mm.
13262. Gane Road, Gillolo Island, Moluccas, Dutch East Indies. December 1, 1909. Length, 145 mm.
18423. Nan Wan, Formosa. January 25, 1910. Length, 133 mm.

12552, 12553, 13860. Apra Bay, Guam. November 19–21, 1907. Length, 43 to 104 mm.

56050 U.S.N.M. Luzon. Philippine Commission. 1 example. Length, 190 mm.

58034 U.S.N.M. Zamboanga. Dr. E. A. Mearns. 1 example. Length, 180 mm.

59011 U.S.N.M. Bacon. Bureau of Fisheries. 1 example. Length, 107 mm.

65459 U.S.N.M. Mangareva. *Albatross* collection. 1 example. Length, 100 mm. As *Cheilinus undulatus*. The squamation of the cheek is that of the present species and not the sparse scales of small size shown in Günther's figure of *Cheilinus godeffroyi*.

72717 U.S.N.M. Java. Messrs. Bryant and Palmer. 1 example. Length, 175 mm.

52369 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 7 examples. Length, 22 to 195 mm.

71633 U.S.N.M. Nafa, Okinawa. Bureau of Fisheries. 1 example. Length, 240 mm.

31057 and 31058 A.N.S.P. Apia. Bureau of Fisheries. Length, 47 to 78 mm.

Genus NOVACULICHTHYS Bleeker

Novaculichthys Bleeker, Proc. Zool. Soc. London [December 10], 1861, p. 414. Type *Labrus taeniourus* Lacépède, monotypic.[22]

Body olong, compressed. Head compressed, upper edge rather obtuse. Front canines 2 in each jaw, curved; lateral teeth small and close set, uniserial. Head usually naked, except sometimes few scales behind or below eye. Dorsals and anals scaleless. Scales in lateral line 26 to 28. Lateral line interrupted. Dorsal with 9 spines and 12 rays. Anal with 3 spines and 12 rays.

East Indies, East Africa, India, Oceania.

ANALYSIS OF THE SPECIES

a[1]. Novaculichthys. Dorsal spines of uniform length; black blotch at front of spinous dorsal; caudal uniform; soft dorsal and anal with numerous obliquely waved dark lines; size moderate ..... **macrolepidotus.**

a[2]. Semachlorella, new subgenus. Two anterior dorsal spines greatly longer than remaining ones; no black spot at front of spinous dorsal; caudal with 2 dark cross bands; soft dorsal and anal with about 5 dark oblique or transverse bands ..... **bifer.**

Subgenus Novaculichthys Bleeker

Mouth moderate. Dorsal spines uniform in length. Several black bands radiate from eye posteriorly, both above and below.

Besides the species below we also include *Novaculichthys taeniourus* (Lacépède), not represented in our collections.

NOVACULICHTHYS MACROLEPIDOTUS (Bloch)

Labrus macrolepidotus Bloch, Naturg. Ausl. Fische, vol. 5, 1791, p. 135, pl. 284, fig. 2. Locality unknown.

Xyrichthys macrolepidotus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 59 (East Indies and Waigiu).—Peters, Arch. Naturg., 1855, p. 264 (Mozambique).

[22] Jordan gives the type *Labrus macrolepidotus* Bloch (Genera of Fishes, vol. 3, 1919, p. 309).

Novaculichthys macrolepidotus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 144, pl. 31, fig. 6 (Bali, Sangi, Amboina, Ceram, Banda, Goram).—JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 788 (Negros).—EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 94 (Bacon).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 508 (Okinawa, Riu Kiu).—FOWLER, Proc. Acad. Nat. Sci. Phila., 1925, p. 259 (Delagoa Bay).

Novacula macrolepidota GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 174 (Mozambique); Fishes of Zanzibar, 1866, p. 96 (Zanzibar).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 377 (Siau).

Labrus arago QUOY and GAIMARD, Voy. Uranie, Zool., 1824, p. 263, pl. 65 fig. 2. Iles des Papous.

Xyrichthys arago STEINDACHNER, Verh. zool. bot. Ges. Wien., 1872, p. 136, pl. 4, fig. 1 (Moluccas?).

Julis taenianotus (CUVIER) QUOY and GAIMARD, Voy. Uranie, Zool., 1824, p. 27. Waigiu.

Julis trimaculatus VALENCIENNES, Hist. Nat. Poiss., vol. 13, 1839, p. 386 (on BLOCH, pl. 284).

Novacula julioides BLEEKER, Nat. Tijds. Ned. Indie, vol. 2, 1851, p. 254. Neira, Banda.

Depth 3⅖ to 3⅘; head 3½ to 3⅗, width 2⅕ to 3⅛. Snout 3½ to 4; eye 4½ to 5, 1⅕ to 1¼ in snout; maxillary 3⅛ to 3½ in head, reaches eye; interorbital 4⅘ to 5¾ in head, convex. Gill rakers 6+12, lanceolate.

Scales in lateral line 20+4 or 5+1; 2 scales above lateral line, 8 or 9 below, predorsal none. Scales with 34 to 40 basal striae, apical 40 to 50 incomplete and obsolete; circuli fine.

D. IX, 13, 1, ninth spine 3⅖ to 3⅞ in head, first ray 2⅙ to 2⅓; A. III, 13, 1, third spine 3⅛ to 4⅓, second ray 2⅛ to 2⅙; caudal 1⅛ to 1¼, convex behind; least depth of caudal peduncle 2⅙ to 2¼; pectoral 1⅔ to 1¾; ventral 1⅓ to 2.

Body pale brownish generally, fins all lighter and under surface of head and trunk little paler. Small black spot in first membrane of spinous dorsal, otherwise fins colorless. Front of head with brown band medianly, with darker brown marginal line each side. Brown band from side of snout to eye, then from postocular arching down toward pectoral origin; also short postocular brown band to suprascapula; short brown crescent on opercular flap behind and like bands bordered with dark brown line. Iris pale yellowish or buff. Some gray spots above and little beyond depressed pectoral, also median streak of brownish bars. Along middle of tail and caudal peduncle laterally some dusky spots, first usually most conspicuous.

Delagoa Bay, Zanzibar, East Indies, Philippines, Riu Kiu.

22386. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 126 mm.

3 examples. Guijulugan shore, Negros. April 2, 1908. Length, 78 to 128 mm. [834, 835.]

1 example. Pandanon Island. March 24, 1909. Length 115 mm. [1440.] General color pale green, more or less yellowish; head with reddish shades above; purplish stripes on sides of head, double one across preorbital, upper

branch running above eye and angling toward nape; lower begins again opposite lower margin of eye, one branch running backward into center of opercle, another above and forking into shoulder; opercular flap with dusky blotch, above tip of pectoral extended an area of pale pink and brown; brownish blotch in middle of body, posterior to middle of soft dorsal; dorsal rays greenish, membranes reddish anteriorly, becoming barred with green posteriorly; black spot in center of first membrane. Caudal pale green, orange distally, specked with reddish brown. Anal rays green, membranes pale reddish with green bars. Ventrals yellowish green; dark spot on breast in front of base. Pectorals dusky pink.

12609 U.S.N.M. Zanzibar. British Museum. Length, 140(?) mm. 1 example (poor condition).

51957 U.S.N.M. Negros. Dr. B. Dean. Length, 52 mm.

56133 U.S.N.M. Luzon. Philippine Commission. Length, 103 mm.

SEMACHLORELLA, new subgenus

Type.—Julis bifer Lay and Bennett.

Mouth rather small. First two dorsal spines greatly elongated, three or more times as long as others; also fifth may be twice length of others, though not so long as first two. Nine black lines radiate from the eye, also extend on iris.

One species.

(Σημα, banner; χλωρὸς, green; *ella*, diminutive; with reference to the features of the type species.)

NOVACULICHTHYS BIFER (Lay and Bennett)

Julis bifer Lay and Bennett, Zool. Beechey's Voyage, 1839, p. 64, pl. 18, fig. 2. Oahu.

Novacula kallosoma Bleeker, Act. Soc.-Sci. Ind. Neerl. (Amboina), vol. 8, 1860, p. 5. Amboina.—Günther Cat. Fish. Brit. Mus., vol. 4, 1862, pp. 176, 508 (East Indies); Journ, Mus. Godeffroy, vol. 8 (16), 1909, p. 286 (Ponape, Tahiti, Samoa, Hawaiian Islands).

Novaculichthys kallosoma Bleeker, Act. Soc. Sci. Ind. Néerl., vol. 1, 1862, p. 145, pl. 31, fig. 3 (Bali and Amboina).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, 1903 (1905), p. 527, pl. 41 (Honolulu. Pago Pago, Negros).

Novaculichthys kallosomus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 788 (Negros).

Depth 3; head 2⅞, width 2⅔. Snout 3⅞; eye 4½, 1⅙ in snout, equals interorbital; maxillary extends little beyond front eye edge, though not to pupil, 3⅔ in head; teeth uniserial, conic, pair of canines forward in each jaw; interorbital 5, convex. Gill rakers 6+13, lanceolate, moderate.

Scales in lateral line 19+4+1; 2 scales above lateral line, 10 below; 3 scales along postero-infraorbital. Scales with 30 basal radiating striae, 33 apical; circuli very fine.

D. II, VII, 12, 1, second spine 1⅕ in head, first ray 2; A. II, 12, 1, third spine 2¾, first ray 1⅗; caudal 1¼, convex behind; least depth of caudal peduncle 2⅛; pectoral 1⅗; ventral 1⅛.

Body with pale brown, with slight olive tinge. From eye 5 pairs of dusky brown lines radiate. Over body scattered rather large pale spots, in about half dozen rows. Each anterior scale with dark brown median line, becoming submarginal posteriorly. Breast dark brown, with whitish band transversely. Abdomen also dark brown, with 2 whitish bands transversely. Five pale blotches along anal base. Iris golden, with dark radiating lines from pupil. Fins all pale. Dorsals with three deep brown vertical bars and alternating narrow pale ones. Anal dark, largely brown, with four whitish submarginal blotches. Caudal with median and marginal brown band. Pectoral whitish. Ventral blackish.

East Indies and Oceania. A beautiful white-blotched green little fish, rare in collections. We find the *Julis bifer* Bennett the earliest name for this species.

52017 U.S.N.M. Negros. Dr. B. Dean. 1 example, 58 mm.
58516 U.S.N.M. Honolulu. E. L. Berndt. 1 example, 82 mm.

Genus CYMOLUTES Günther

Cymolutes Günther, Ann. Mag. Nat. Hist. London, ser. 3, vol. 8, 1861, p. 387. Type *Julis praetextata* Quoy and Gaimard, designated by Jordan, Genera of Fishes, vol. 3, 1919, p. 318.

Body oblong, compressed. Snout little high. No hind canines. Scales very small, more than 70. Head naked, or only small patch of rudimentary scales on cheek. Lateral line interrupted. Dorsal spines 9, alike, rays 12 to 14. Anal spines 2 or 3, rays 12 to 14.

Small fishes of the Indo-Pacific, with rather large head and pale coloration. Though several species have been described likely all are referable to a single widely distributed form.

CYMOLUTES LECLUSE (Quoy and Gaimard)

Xyrichthys lecluse Quoy and Gaimard, Voy. Uranie, Zool., 1824, p. 284, p. 284, pl. 65, fig. 1. Hawaiian Islands.

Cymolutes leclusii Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 207 (copied); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 289 (Hawaiian Islands).

Cymolutes lecluse Jenkins, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 465 (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 327 (Hilo and Honolulu).

Julis praetextata Quoy and Gaimard, Voy. Astrolabe, Zool., vol. 3, 1834, p. 712, pl. 15, fig. 4. "Mauritius."

Cymolutes praetextatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 146, pl. 31, fig. 1 (Java, Bali, Celebes, Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 207 (Amboina); Fishes of Zanzibar, 1866, p. 182 (Zanzibar).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Ternate).—Day, Fishes of India, pt. 3, 1877, p. 409, pl. 90, fig. 1; Fauna British India, vol. 2, 1889, p. 420, fig. 145.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 289 (Pelew Islands).

Xyrichthys microlepidotus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 52. Oahu, Hawaiian Islands.

Xyrichthys torquatus VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 54, pl. 392. "Surinam" [East Indies].

Xyrichthys novaculoides BLEEKER, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 122. Amboina.

Novacula xyrichthyoides BLEEKER, Nat. Tijds. Ned. Indie, vol. 10, 1856, p. 488. (On *Xyrichthys novaculoides* BLEEKER, 1852.)

Julis kuelknel THIOLLIÈRE, Fauna Woodlark, 1857, p. 195. Woodlark Island.

Novacula microlepis VAILLANT and SAUVAGE, Rev. Mag. Zool., vol. 3, 1875, p. 284. Hawaiian Islands.

Depth 4 to 4⅖; head 2¾ to 2⅘, width 2⅞ to 3. Snout 2⅙ to 2⅖; eye 4¾ to 6, 2 to 2½ in snout, greater or equals interorbital; maxillary reaches ⅔ to ¾ to eye, 3⅓ to 3⅖ in head; interorbital 6 to 6⅓ in head, little convex. Gill rakers 7+10, short, lanceolate.

Scales in lateral line 57 to 60, 15 to 17+5; 4 or 5 scales above lateral line, 19 or 20 below, 5 or 6 predorsal. Scales with 23 to 27 basal marginal striae, 16 or 17 apical; circuli moderate.

D. IX, 12, 1 or 13, 1, ninth spine 4⅔ to 4⅞ in head, first ray 3⅙ to 4; A. III, 11, 1 to 13, 1, third spine 4⅖ to 5, first ray 3 to 3⅛; caudal 1¾ to 1⅘, truncate; least depth of caudal peduncle 2⅞ to 3⅛; pectoral 1⅘ to 1⅚; ventral 2⅛ to 2½.

Drab gray above, pale to whitish on head below and abdomen. Iris yellowish. Fins pale. Dorsals with grayish brown waved close-set lines, little inclined from vertical. Small examples usually with small blackish point at upper base of caudal and blue line close along edge of back.

Widely distributed from Mauritius and Zanzibar to the East Indies, Micronesia, and Hawaii. This species is subject to various combinations in color-pattern, due to preservation. Often many markings may be obscure, while in fresh specimens the color is largely whitish. Three of the Pandanon Island examples all show the brown oblique lines on the tail as in Bleeker's figure, but usually without the dark band in the humeral region. All have a dark vertical posterior streak on the opercle, not shown by Bleeker.

18 examples, Cebu market. September 3, 1919. Length, 84 to 126 mm. [1882, 1883.]

6 examples, Pandanon Island. March 24, 1909. Length, 81 to 126 mm. [1447 to 1450.]

51132 U.S.N.M. Hawaiian Islands. U. S. Fish Comm. Length, 135 mm.

55051 U.S.N.M. Honolulu. *Albatross* collection. Length, 158 to 162 mm. 2 examples.

55365 U.S.N.M. Honolulu. *Albatross* collection. Length, 125 mm. 1 example.

65808 U.S.N.M. Namuka, Tonga Island. *Albatross* collection. Length, 76 mm. 1 example.

12573 U.S.N.M. Zanzibar. British Museum. Length, 140 to 162 mm. 2 examples.

29664 to 29667 A.N.S.P. Honolulu. Jordan and Snyder. Length, 130 to 157 mm.

Genus HEMIPTERONOTUS Lacépède

Hemipteronotus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, p. 214. Type *Hemipteronotus quinque-maculatus* Lacépède, designated by Bleeker, Proc. Zool. Soc. London (December 10), 1861, p. 414.

Body strongly compressed, oblong, rather deep. Head deep, elevated, upper profile parabolic, well compressed. Mouth low, moderate. No hind canines. Cheek with several rows of small scales. Lateral line interrupted. Dorsal spines 9, of which first 2 separated from others, rays 12. Anal spines 3, rays 12.

Indo-Pacific.

ANALYSIS OF THE SPECIES

a^1. Cheek scales extend well down to lower branch of preopercle; caudal peduncle pale ..... **pentadactylus.**

a^2. Cheek scales only on upper half of cheeks; side of caudal peduncle with dark blotch ..... **celebicus.**

HEMIPTERONOTUS PENTADACTYLUS (Linnaeus)

Coryphaena pentadactylus Linnaeus, Syst. Nat., ed. 10, 1758 p. 261. India.

Novacula pentadactyla Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 69, pl. 395 (Celebes).—Richardson, Proc. Brit. Assoc. Adv. Sci. (Ich. Chin. Jap.), 1846, p. 261 (China, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 177 (Amboina and China).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 532 (Koseir, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 402 (Bombay).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 37 (North Celebes).—Day, Fauna British India, vol. 2, 1889, p. 411.—Elera, Cat. Fauna. Filip., vol. 1, 1895, p. 554 (Luzon, Lobo, Batangas).

Hemipteronotus pentadactylus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 150, pl. 30, fig. 4 (Bali, Celebes, Ternate, Buru, Amboina, Ceram).—Bleeker, Rec. Fauna Madagascar, Pollen et Van Dam, vol. 4, 1874, p. 65.—Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 31 (Manila).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 377 (Menado, Kawa, Ambon).—Fowler, Copeia, No. 58, June 18, 1918, p. 64 (Philippines).

Novacula (*Hemipteronotus*) *pentadactyla* Sauvage, Hist. Nat. Madagascar Poiss., 1891, p. 459 (types).

Hemipteronotus quinque-maculatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 214, 215. China, Moluccas, East Indies.

Xirichthys cyanirostris (Cuvier) Guerin-Meneville, Icon. Règ. An. Poiss., vol. 3, 1829–1838, p. 27, pl. 43, fig. 3. Pondichery.

Novacula sex-maculata Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 72. Bombay.

Novacula punctulata Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 73. Bombay.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 555 (Cavite, Luzon, Santa Cruz).

Novacula tessellata Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 74. Mauritius.

Hemipteronotus umbrilatus Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 53, fig. 10. Honolulu.

Depth 2⅞ to 3⅛; head 2⅞ to 3⅖, width 2⅓ to 2¾. Snout 1⅞ to 2⅔; eye 4⅛ to 6, 1½ to 3½ in snout, 1¼ in interorbital; maxillary reaches ⅜ to ⅘ in snout, 3¼ to 4 in head; interorbital 5 to 5¾, convex. Gill rakers 7+8, lanceolate, short.

Scales in lateral line 20 to 22+3 or 4+1 or 2; 3 or 4 scales above lateral line, 9 or 10 below; 7 to 9 rows of scales on cheek. Scales with 81 to 92 basal radiating striae; apical striae obsolete, imperfect; circuli very fine.

D. IX, 12, 1, second spine 2⅕ in head, ninth spine 3⅔ to 3⅘, first ray 3 to 3½; A. III, 11, 1, or 12, 1, third spine 3⅗ to 4½, first ray 2⅞ to 3½; caudal 1⅔ to 1½, convex behind; least depth of caudal peduncle 2¼ to 2⅖; pectoral 1⅔ to 1⅗; ventral 1⅘ to 2½.

Largely uniform dull brown. Iris yellowish brown. Usually pale brown spot behind eye and three along front of lateral line. Mandible with two transverse gray lines. Dorsals and anals with obscure grayish transverse waved bands.

Red Sea, India, East Indies, China, Honolulu. When fresh in alcohol easily known by the pale costal area surmounted by a blackish spot. Small examples show the back with small scattered blackish spots and four obsolete vertical dark cross bands, first as black spot above pectoral base, next two from dorsals to anals, and last at caudal base.

6783 and 20324. Bolinao Bay. May 10, 1909. Length, 83 to 108 mm.

6040 to 6056. Hinunangan Beach, Leyte Island. July 30, 1909. 50 examples. Length, 55 to 161 mm. [1790.] Olive green, paler below; scapular region with five crimson spots; dusky spot above tip of extended pectoral; behind scattered scarlet specks size of small pin heads, at tip of scales; almost regular row on second full row below dorsal, thence scattered over most of side, becoming regular on peduncle; throat brassy, median blue line on isthmus in pink field; blue or pale purplish line from this to tip of chin and branch behind chin to corner of mouth; bright blue line from tip of snout to anterior of dorsal, pink line behind on its margin; opercle crossed by three partial bars, or its interval between somewhat orange. Dorsal bluish hyaline, much mottled with vermilion and becoming plain vermilion on tip. Caudal rays body color, membranes with bronzy round spots somewhat larger than scarlet specks on body. Anal lavender blue at base, becoming hyaline terminally, crossed by four scarlet bars, first broken along inner margin, second through outer ⅖ and third and last on either side of bluish base. Anus vermilion. Paired fins dusky. Pectoral dark, with dark bar at base, ending in blue spot above and obscure orange lines on either side. [1791.] Scapular spots small and only three or four in number. On side of abdomen bright pink area crossed by five diagonal lines running down and forward, outlined by yellowish; about pink area and in field surrounding it irregular small scarlet dots similar to those on side.

22069 to 22071. Inamucan Bay, Mindanao. August 8, 1909. Length, 98 to 132 mm.

11625 and 11626. Limbones Cove. January 14, 1908. Length, 148 to 160 mm.

5237. Malabang, Mindanao. May 21, 1908. Length, 150 mm.

19625. Mansalay, Mindoro. June 4, 1908. 6 examples. Length, 76 to 107 mm.

4 examples, Nogas Point, Panay. February 4, 1908. Length, 55 to 120 mm.
85480 U.S.N.M. Formosa. Dr. F. Baker. Length, 76 to 133 mm. 4 examples.
29729 A.N.S.P. Honolulu. Jordan and Snyder. Length, 190 mm.
28238 to 28239 A.N.S.P. Hawaiian Islands. U. S. Fish Comm. Length, 248 mm.
48652 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 145 mm.

HEMIPTERONOTUS CELEBICUS (Bleeker)

Novacula celebica BLEEKER, Act. Soc. Sci. Ind. Neérl. (Manado), vol. 1, 1856, p. 61. Macassar.
Hemipteronotus celebicus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 153, pl. 30, fig. 5 (Celebes and Amboina).

Depth 3; head 3¼, width 2⅖. Snout 2; eye 5¼, 2¾ in snout, equals interorbital; maxillary reaches ⅘ to eye, 3⅕ in head; interorbital 6, convex, with trenchant keel forward. Gill rakers 7+8, lanceolate, robust, short.

Scales in lateral line 19+4+1; 3 scales above lateral line, 10 below. Scales with 52 basal radiating striae; 20 apical feeble and indistinct; circuli very fine.

D. II, VII, 12, 1, eighth spine 4⅗ in head, first ray 3⅓; A. III, 12, 1, third spine 4⅖, first ray 3⅙; caudal 1⅓, convex behind; least depth of caudal peduncle 2⅖; pectoral 1½; ventral 1½.

Brown generally, little paler below. Pale slate blotch at tip of depressed pectoral, in size about equal to eye diameter. Dull gray streak extends from dark post-pectoral blotch, another along anal base parallel, also vertical gray bar on scales of caudal base. Fins all whitish. Dorsals with slight oblique pale gray lines. Anals pale, with whitish basal horizontal line and another subbasal white line. Iris pale straw yellow.

East Indian region. Known only from the two examples reported by Bleeker.

3190. Makassar market. December 22, 1909. Length, 147 mm. Differs from Bleeker's figure in the large post-costal spot with grayish bars, also blotch at caudal base different in shape.

Family CALLYODONTIDAE

PARROT FISHES

Body usually oblong or moderately compressed. Mouth moderate or small, terminal. Front teeth more or less united as a parrot-like beak. Palate toothless. Two nostrils. Gills, 4. Pharyngeal bones flat, with tessellated or mosaic teeth; lower completely fused as concave or spatulate bone, without suture medially. No subocular shelf. Vertebrae 24 or 25, of which 14 caudal. Scales large, cycloid, 23 to 27 in lateral line. Dorsal spines 9, rays 10. Anal with 2 spines and 9 rays.

Brilliant tropical fishes, living about coral rocks and reefs. They feed chiefly on vegetable matter and invertebrates, their strong beaks easily crushing corals and mollusks. Most reach a fair or large size, some 4 feet or more. While some are valued as food, others are avoided as poisonous.

ANALYSIS OF THE GENERA

a^1. SPARISOMINAE. Teeth in jaws not fully coalesced; cutting edges of jaws formed by more or less distinct teeth; gill membranes broadly joined to isthmus; single row of scales on cheek; lateral line continuous.
  b^1. Anterior teeth joined together, those of lower jaw in very oblique series ..... **Scarichthys.**
  b^2. Anterior teeth imbricate, more or less distinct ..... **Leptoscarus.**
a^2. CALLYDONTINAE. Teeth in jaws fully coalesced, each jaw divided by median suture; cutting edges of jaws without distinct teeth; gill membranes form fold across isthmus; scales on cheek in 2 or more rows; lateral line interrupted ..... **Callyodon.**

Genus SCARICHTHYS Bleeker

Scarichthys BLEEKER, Nat. Tijds. Ned. Indie, vol. 19, 1859, p. 344. Type *Scarus naevius* VALENCIENNES, monotypic.

Upper lip double all around. Teeth prominently convex, upper coalesced, lower in very oblique rows. Front nostril with short cirrhus. Scales in lateral line 24 to 29. Dorsal spines 9, flexible rays 10 or 11. Anal spines 3, rays 8 or 9.

Two species in the Indo-Pacific.

ANALYSIS OF THE SPECIES

a^1. No flaring canines externally from dental face of upper jaw ..... **auritus.**
a^2. Series of flaring canines on outer face of upper beak ..... **coeruleopunctatus.**

SCARICHTHYS AURITUS (Valenciennes)

Scarus auritus (KUHL and VAN HASSELT) VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 218. Java.

Scarichthys auritus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 15, pl. 1, fig. 3 (Java, Celebes, Timor, Banda, Amboina).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 213 (Amboyna, Hong Kong, Aneiteum).—BLEEKER, Ned. Tijds. Dierk., vol. 1, 1863, p. 265 (Atapupu, Timor); Verslag. Akad. Wet. Amsterdam, vol. 16, 1864, p. 367 (Aru Islands, Moluccas).—GÜNTHER, Fishes of Zanzibar, 1865, p. 102 (Zanzibar).—GUICHENOT, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 18 (Seychelles, type of *Scarus naevius*).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius).—OGILBY, Austral. Mus. Mem., vol. 2, 1889, p. 70 (Lord Howe Island).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 558 (Luzon, Manila).—SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).—JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 268 (Cagayancillo).—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 299 (Ponape, Aneiteum, Rarotonga).—MCCULLOCH, Proc. Linn. Soc. New South Wales, vol. 36, 1912, p. 606 (Murray Island, Queensland).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 383 (Samau, Gisser, Aru Islands).

Choerops auritum EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Bacon).

Callyodon chlorolepis (part) RICHARDSON, Voy. Sulphur, Fish., 1844, p. 137, pl. 64, figs. 4–7. Hong Kong.

Scarus naevius VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 253. Seychelles, Mahé.

Scarichthys caeruleopunctatus (part) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 304 (Vavau).

Depth 3 to 3⅖; head 3 to 3⅛, width 2$\frac{1}{10}$ to 2⅖. Snout 2⅖ to 3¼; eye 4¼ to 6, 1⅖ to 2⅕ in snout, 1⅛ to 1⅖ in interorbital; mouth cleft, 3⅖ to 4⅓ in head; lips cover teeth; no flaring canines anteriorly; interorbital 4 to 4⅘, slightly elevated, level. Gill rakers 3+7, short, strong, firm points.

Scales in lateral line 18 to 20, 4 or 5+2; 2 scales above lateral line, 6 below, 4 predorsal; cheek with row of 4 scales. Scales with 23 to 27 basal radiating striae, apical 29 to 31; circuli fine.

D. IX, 10, 1 or 11, 1, ninth spine 2¼ to 2½ in head, first ray 2⅛ to 2¼; A. III, 8, 1, third spine 3⅛ to 4⅛, first ray 2⅖ to 2⅗; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2½ to 3; pectoral 1¾ to 1⅞; ventral 1⅘ to 2.

Brown generally, each scale with darker basal blotch and traces of variable whitish spots scattered over trunk and tail. Fins all brownish, vertical ones variegated with darker blotches, mostly as spots on soft rays.

East Africa to the East Indies, Ponape, Rarotonga.

6499. Balikias Bay. July 17, 1908. Length, 218.

10691 to 10693, 12873. Catabato, below river mouth, Mindanao. May 20, 1908. 8 examples. Length, 48 to 167 mm.

10620, 22655, 22656. Cataingan Bay, Masbate. April 18, 1908. 8 examples. Length, 60 to 167 mm. [569.] Dark olive-green on top of head and back, becoming paler on sides; white, with yellowish wash, on belly and breast; sides and belly with numerous purplish blue spots, those on the lower side with pale encircling rims; upper lip pale olive, lower somewhat orange; purplish band on back of chin, spots of same color on branchiostegal membranes under interopercular flap. Dorsal and caudal similar to body but more yellowish; anal pale dull orange, mottled with dusky; ventral brownish, base yellowish distally; pectoral pale yellowish, dark at base. Iris dusky silver. Teeth white. [570.] Teeth white; top of head and back green; breast and belly white, with yellowish wash. Similar in all respects to No. 569, but no blue spots; chin band white instead of blue.

22391 and 22392. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 85 to 94 mm.

8407 and 8415. Cebu Market. March 20, 1909. Length, 280 to 318 mm. Somewhat bright green, lower head and body with reddish shades, particularly on scale centers; sparsely spotted with bluish-white below and with rather coarse lavender spots on back; dorsal rays posteriorly with darker spots; caudal with large pale spots and cloudings; anal yellowish, with red-brown mottling; pectorals very pale yellow, reddish at bases; lower head without spots, also breast and belly.

1 example, Guijulugan Shore, Negros. April 2, 1908. Length, 51 mm.

1 example, Guijulugan. April 22, 1908. Length, 55 mm.
4858. Jolo market. February 12, 1908. Length, 200 mm.
20277 and 20280. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 100 to 132 mm.
11777, 11779, 11781, 11785. Mansalay, Mindoro. June 4, 1908. Length, 55 to 180 mm. 19 examples.
5857 and 5860. Near Mindanao River. May 20, 1908. Length, 235 mm. Without small specks; general colors olivaceous to green; lower parts lighter, light inclining to show as stripes on lower side; bright color on opercular margin much less pronounced; upper teeth green lower brownish at edge, greenish at base.
10363. Port Jamelo, Luzon. July 13, 1908. Length, 148 mm.
1 example, Tilig Harbor, reef, Lubang Island. July 15, 1908. Length, 100 mm.
10870. Varadero Bay, Mindoro. July 2, 1908. Length, 117 mm.
5833 U.S.N.M. Zamboanga. Dr. E. A. Mearns. 2 examples. Length, 190 to 205 mm.
56003 U.S.N.M. Jolo. Bureau of Fisheries. 1 example. Length, 240 mm.
66013 U.S.N.M. Vavau, Tonga. Albatross Collection. 1 example 69 mm. As *Scarichthys coeruleopunctatus.*

SCARICHTHYS COERULEOPUNCTATUS (Rüppell)

Scarus (Calliodon) coeruleopunctatus Rüppell, Neue Wirbelth. Fische, 1835, vol. 24, pl. 7, fig. 3. Djedda, Red Sea.

Scarus coerulo-punctatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 262 (Djedda).

Scarichthys coeruleopunctatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1. 1862, p. 16, pl. 1, fig. 2. (Cocos, Celebes, Ternate, Buru, Amboina, Banda) —Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 213 (East Indies); Fishes of Zanzibar, 1865, p. 103 (Zanzibar).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 19 (Djedda).—Klunzinger, Verh. zool. bot. Ges. Wien., vol. 21, 1871, p. 557 (Red Sea).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 443 (Mauritius, Seychelles).—Day, Fishes of India, pt. 3, 1877, p. 410, pl. 87, fig. 5.—Martens, Preuss. Exp. Ost Asien, 5, 1881, p. 397 (Amboina R.).—Day, Fauna British India, vol. 2, 1889, p. 422, fig. 147.—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Bacon, Bulan, Jolo).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 245 (Zamboanga).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 300 (Rarotonga).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 304 (Vavau, Tonga Islands).

Scarichthys coeruleopunctatus Fowler, Proc. Acad. Nat. Sci. Phila., 1925. p. 260 (Delagoa Bay).

Scarus rubro-notatus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 212. Arabian Gulf and Red Sea.

Scarus bottae Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 262. Djedda.

Scarichthys bottae Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 20 (types; Java).

Scarus rubropunctatus Bleeker, Atlas Ichth. Ind. Neerl., vol. 1, 1862, p. 17 (name in synonymy).

Depth 3 to 3⅖; head 2⅘ to 3⅖, width 2 to 2¼. Snout 2⅔ to 3; eye 4⅕ to 6⅛, 1⅔ to 2⅔ in snout, 1¼ to 1½ in interorbital; mouth cleft 3⅖ to 4 in head; lips cover teeth; 8 teeth flaring out in front of upper jaw; interorbital 4 to 4¾, convex. Gill rakers 3+8, short firm points.

Scales in lateral line 20 or 21, 5 or 6+2; 2 scales above lateral line, 6 below, 4 predorsal; cheek with row of 4 scales. Scales with 19 basal radiating striae, apical 30; circuli very fine.

D. IX, 10, 1, ninth spine 2⅛ to 2¾ in head, first ray 2⅛ to 2¼; A. III, 9, 1, third spine 2⅞ to 3⅛, first ray 2¼ to 2⅞; caudal 1⅓ to 1⅔, convex behind; least depth of caudal peduncle 2⅛ to 2⅗; pectoral 1⅔ to 1⅘; ventral 1⅘ to 1⅞.

Body pale brownish generally, with numerous small azure to blue gray spots, dots or short bars. Pale grayish white longitudinal streak from middle of opercle, little below median axis of body to caudal base. Fins all pale brownish. Caudal spotted with grayish white and rays of dorsals and anals each with 3 dark spots. Paired fins dull brown.

Red Sea, Zanzibar, Mauritius, India, East Indies, Tonga.

6498. Balikias Bay. July 17, 1908. Length, 212 mm.
12874. Catabato, Mindoro. May 20, 1908. Length, 172 mm.
5326. Cebu Market. April 4, 1908. Length, 247 mm. Olivaceous, mottled with darker. Reddish shades about mouth, sides of head and opercle.
5858 and 5859. Near Mindanao River. May 20, 1908. Length, 202 to 232 mm. Teeth white below with brown edge and slight greenish tinge at base; general color olivaceous, with spots of bluish green; opercle margined with scarlet; belly buff white; breast and throat washed with yellow; brownish shades on anal; dorsal hyaline orange.
7298. Sablayan, Mindoro. December 12, 1908. Length, 105 mm. Teeth dusky white; tip of nose blue; lip becoming orange at corner of mouth; lower lip narrowly orange, blue behind, then orange. Orange stripe across preorbital, forking behind eye; general color green; side of head broadly green, with orange area above pectoral; front and margin or dorsal blue; base blue, body orange, with blue incomplete central band; anal blue with incomplete orange band; orange stripe in center of pectoral.
8416. Hokuho, Soo Wan, Formosa. January 29, 1910. Length, 283 mm.
56048 U.S.N.M. Jolo. Philippine Commission. 1 example. Length, 250 mm.
58032 U.S.N.M. Zamboanga. Dr. E. A. Mearns. 3 examples. Length, 240 to 250 mm.

Genus LEPTOSCARUS Swainson

Leptoscarus Swainson, Nat. Hist. An., vol. 2, 1839, p. 226. Type *Scarus vaigiensis* Quoy and Gaimard, monotypic.

Calotomus Gilbert, Proc. U. S. Nat. Mus., vol. 13, 1890 (1891), p. 70. Type *Calotomus xenodon* Gilbert, orthotypic.

Upper lip double only short extent. Teeth separated, subequal, imbricate, in regular oblique rows in both jaws, entirely hiding dental plate; outer teeth form cutting edges to both jaws. Front nostril with short cirrhus. Scales in lateral line 25 to 30. Dorsal spines 9, flexible; rays 10. Anal spines 3; rays 9.

Tropical Pacific.

ANALYSIS OF THE SPECIES

a^1. Calotomus. Eye without pale radiating lines.
  b^1. No dark blotch at pectoral base ..... moluccensis.
  b^2. Pectoral base with large dark blotch ..... viridescens.
a^2. Leptoscarus. Eye with 8 narrow radiating pale or whitish lines. vaigiensis.

LEPTOSCARUS MOLUCCENSIS (Bleeker)

Callyodon moluccensis BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 12, pl. 2, fig. 1. Badjoa and Tanbariri, Celebes; Ternate; Lebuka; Batjan; Kupang, Timor; Amboina; Wahai, Ceram; Neira and Lanthoir, Banda.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 216 (Aneiteum), Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 302 (type; Aneiteum).

Calotomus vaigiensis (not QUOY and GAIMARD) JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).

Scarichthys caeruleopunctatus (not RÜPPELL) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 304 (Vavau, Tonga Islands).

Depth 2¾ to 2⅘; head 3, width 2 to 2⅛. Snout 3 to 3⅕; eye 4⅛ to 4¼, 1⅖ to 1½ in snout, equals interorbital; mouth cleft 3¾ to 4⅗ in head; upper outer canines 7 to 12; single small tooth at right side of vomer, sometimes 1 or 2 on palatines; interorbital level. Gill rakers 3+6, short points.

Scales in lateral line 19 or 20, 5+2 to 5; 2 scales above lateral line, 6 below, 4 or 5 predorsal; row of 4 scales on cheek. Scales with 12 to 14 basal radiating striae, apical 13 to 15; circuli fine.

D. IX, 10, 1, ninth spine 2¼ to 2½ in head, first ray 2⅓ to 2⅖; A. III, 9, 1, third spine 3⅖ to 3⅔, first ray 2⅞ to 3; caudal 1⅓ to 1⅖, convex behind; least depth of caudal peduncle 2⅔ to 3; pectoral 1⅖ to 1⅗; ventral 1⅞ to 2.

Brown, paler to whitish on under surface of head, belly, abdomen, and tail. Sides and upper surfaces everywhere with fine mottlings or dots of paler. Along back and sides 5 series of small whitish spots, about 3 in each series. Several rather large whitish spots along each side of head below and on lower preopercle flange. Vertical fins all pale brownish, spotted with darker. Paired fins pale. Ventrals whitish. Iris brownish.

East Indies, Melanesia. In general coloration very like *Leptoscarus vitidescens*, but the latter has no enlarged teeth within the mouth or on the palatine region and the pectoral base is pale.

4 examples Cabuago Bay, Catanduanes Island. June 9, 1909. Length, 44 to 60 mm.

22654. Cataingan Bay, Masbate. April 18, 1908. Length, 72 to 119 mm.

18678. Cebu market. March 24, 1909. Length, 174 mm. [1468.]

1 example, Guijulugan shore. April 2, 1908. Length, 88 mm.

6 examples, Mansalay, Mindoro. June 4, 1908. Length, 59 to 94 mm.

7 examples, Port Galera, Mindoro. June 9, 1908. Length, 43 to 74 mm.

21641. Port Jamelo, Luzon. July 13, 1908. Length, 121 mm.

8 examples, Port Matalvi, Luzon. November 23, 1908. Length, 37 to 86 mm.

20618. Sirinao Island, Nakoda Bay. December 30, 1908. Length, 128 mm.

8389 to 8391, 20935 and 22896. Surigao, Mindanao. May 8, 1908. Length, 79 to 157 mm.

3 examples, Varadero Bay. July 23, 1908. Length, 58 to 74 mm.

52011 U.S.N.M. Negros Island. Dr. Bashford Dean. Length, 46 mm. As *Calotomus vaigiensis*.

66013 U.S.N.M. Vavau, Tonga. *Albatross* collections. 6 examples. Length 78 to 94 mm. As *Scarichthys caeruleopunctatus*.

LEPTOSCARUS VIRIDESCENS (Rüppell)

Scarus (*Calliodon*) *viridescens* Rüppell, Neue Wirbelth., Fische, 1835, p. 23, pl. 7, fig. 2. Djedda, Red Sea.

Callyodon viridescens Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 214 (Red Sea); Fishes of Zanzibar, 1866, p. 103 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 558 (Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 410, pl. 90, fig. 2 (Andamans); Fauna Brit. India, vol. 2, 1889, p. 422, fig. 148 (copied).

Leptoscarus viridescens Fowler, Proc. Acad. Nat. Sci. Phila., 1925, p. 261 (Delagoa Bay).

Callyodon sandwicensis Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 295. Hawaiian Islands.—Guichenot, Mem. Soc. Cherbourg, vol. 11, 1865, p. 62 (type).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 301, pl. 151 (Hawaiian Islands).

Calotomus sandwicensis Fowler, Proc. Acad. Nat. Sci. Phila., 1900, p. 512 (Hawaiian Islands).

Calotomus sandvicensis Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23 (1), 1903 (1905), p. 341 (Honolulu, Kailua).

Leptoscarus sandwicensis Jordan and Jordan, Mem. Carnegie Mus., vol. 10, No. 1, December, 1922, p. 75 (Honolulu).

Calotomus cyclurus Jenkins, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 465, fig. 24. Honolulu.

Calotomus moluccensis (not Bleeker) Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).

Scarichthys rarotongae Seale, Occas. Pap. Bishop Mus., vol. 4 (1), 1906, p. 59, fig. 8. Rarotonga, Cook Islands.

Scarichthys coeruleopunctatus (part) Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 304 (Vavau, Tonga Islands).

Depth 2⅕ to 3; head 2 to 3⅛, width 2 to 2⅕. Snout 2⅔ to 3¼; eye 4 to 7, 1⅙ to 2¾ in snout, 1 to 1¾ in interorbital; mouth cleft 3½ to 4 in head; lips cover teeth; outer upper teeth 13 to 20, irregularly biserial; below median symphyseal tooth with 3 or 4 superimposed rows each side, and 2 to 6 teeth in each row; interorbital 4 to 5 in head, convex. Gill rakers 5+7, short, rather flexible.

Scales in lateral line 19 or 20, 5+2; 2 scales above lateral line, 6 below, 4 predorsal; cheek scales in single row of 3 or 4, variable even in same individual. Scales with 30 to 33 basal radiating striae, 36 to 61 feeble and imperfect apically; circuli very fine.

D. IX, 10, 1, ninth spine 2⅖ to 3 in head, first ray 2¼ to 2¾; A. III, 9, 1, third spine 3⅓ to 4⅛, first ray 2⅞ to 3¼; caudal 1⅙ to 1⅖, emarginate, points but slightly exserted, hind edge little convex as expanded; least depth of caudal peduncle 2⅙ to 3; pectoral 1⅖ to 1⅗; ventral 1⅔ to 1⅞.

Brown generally, each scale finely mottled with darker and with many dark obscure waved lines. At bases of many scales on trunk and tail pale or whitish spot of varying intensity. First membrane of spinous dorsal dusky, rest of fin brown with paler variable marblings and blotches. Anal brown, with dark blotches, some large and conspicuous basally. Caudal brown, with transverse waved

whitish lines and hind edge narrowly white. Paired fins brown. Pectoral with deep brown base and ventral mottled with dark brown terminally.

Red Sea, Delagoa Bay, Andamans, East Indies, Cook Islands, Hawaii. So far as we find there is little to distinguish the nominal *Callyodon sandwicensis* Valenciennes.

6782. Bolinao Bay. May 10, 1909. Length, 80 mm.
A580. Busbus Point, Siasi. September 20, 1909. Length, 230 mm.
10621. Cataingan Bay, Masbate. April 18, 1908. Length, 95 mm.
19056. Cebu market. March 20, 1909. Length, 152 mm. [1427.] General color, gray, mottled with darker gray and whitish; dorsal and anal with reddish-brown mottling, latter brighter; ventrals very pale specked; pectorals clear, very pale yellowish.
12665. Cebu market. April 4, 1908. Length, 165 mm.
20510. Guijulugan shore. April 2, 1908. Length, 88 mm.
13979. Iloilo market. May 31, 1908. Length, 138 mm.
22600. Observatory Island. Length, 69 mm.
1 example, Philippines. Length, 128 mm.
6536. Point Maricaban. July 21, 1908. Length, 307 mm.
20352. Port Matalvi, Luzon. November 22, 1908. Length, 48 mm.
9303. Silino Island. August 10, 1909. Length, 280 mm. General color olive-brown, becoming greenish on fading; lower surfaces somewhat purplish shade; teeth white; head and nape with few obscure whitish specks; scales of side show similar specks, upon fading none visible, none dark color and full; dorsal similar to body, slightly mottled with paler; caudal same, edge in fork whitish or hyaline; anal with purplish shade; ventrals somewhat similar to anal; pectorals olive, with few whitish specks on rays toward base.
20936. Surigao, Mindanao. May 8, 1908. Length, 76 mm.
10873. Varadero Bay, Mindoro. May 31, 1908. Length, 98 mm.
10868, 10871, 10872, 10874, 20833. Varadero Bay. July 23, 1908. Length, 62 to 73 mm.
10868. Varadero Bay. December 19, 1908. Length, 73 mm.
A794. Zamboanga market. October 6, 1909. Length, 282 mm.
22378. Sandakan, Borneo. March 2, 1908. Length, 152 mm.
A1308. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 208 mm. Dusky olive, fins with some reddish, scarcely mottled; few grayish spots on side, show most after fading; obscure bar from eye to corner of mouth.
50849 U.S.N.M. Honolulu. Dr. O. P. Jenkins. Type of *Calotomus cyclurus*.
52037 U.S.N.M. Negros Island. Dr. Bashford Dean. Length, 70 mm. As *Calotomus moluccensis*.
52770 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. 1 example. Length, 278 mm. As *Calotomus cyclurus*.
66013 U.S.N.M. Vavau, Tonga. Length, 147 mm. As *Scarichthys caeruleo-punctatus*.
71338 U.S.N.M. Tokyo market. *Albatross* collection. 2 examples. Length, 168 to 180 mm.
71760 U.S.N.M. Tokyo market. *Albatross* collection. 1 example. Length, 270 mm.

LEPTOSCARUS VAIGIENSIS (Quoy and Gaimard)

Scarus vaigiensis Quoy and Gaimard, Voy. Uranie, Zool., December 18, 1824, p. 288. "Vaigiou" (Waigiu).

Scarichthys vaigiensis Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 63 (type).

Callyodon vaigiensis Weber, Siboga Exp., vol. 57, Fische, 1913, p. 383 (Biaru, Saleyer, Nusa Laut, Rotti).

Scarus spinidens Quoy and Gaimard, Voy. Uranie, Zool., December 28, 1824, p. 289. Vaigiou (same type as *Scarus vaigiensis*).

Callyodon spinidens Bleeker, Atlas Ich. Ind. Néerl., vol. 1, 1862, p. 13, pl. 2, fig. 2 (Sumatra, Cocos, Bali, Sangi, Ternate, Amboina, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 215 (Amboina, Moluccas).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Amboina).—Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 443 (Ternate).

Callyodon genistriatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 293. No locality.—Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 13, pl. 1, fig. 1 (Celebes and Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 215 (East Indies); Fishes of Zanzibar, 1865, p. 103.—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 61 (type).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 95 (Zamboanga and Jolo).—Günther, Journ. Mus. Godeffroy, vol. 3 (6), 1909–10, p. 300, pl. 150 (Zanzibar, Ponape, New Britain, Upolu, Tahiti, Fiji, Bleeker's example).

Callyodon hypselosoma Bleeker, Nat. Tijds. Ned. Indie, vol. 8, 1855, p. 425. Amboina.

Callyodon moluccensis (not Bleeker) Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 268 (Cuyo).

Calotomus irradians Jenkins, Bull. U. S. Fish. Comm., vol. 19, 1899 (1900), p. 58, fig. 15. Honolulu.

Scarichthys coeruleopunctatus (part) Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, 1911, p. 304 (Vavau).

Depth 2¼ to 2½; head 3 to 3¼, width 1⅞ to 2. Snout 2⅔ to 2½; eye 5¾ to 8½, 2¼ to 2½ in snout, 1⅔ to 1½ in interorbital; mouth cleft 3⅔ to 3⅗ in head; outer upper teeth 21 in 2 irregular compressed rows and inner teeth as patch of 7 obtuse ones or only few conic; lower teeth in 7 superimposed rows each side, 2 to 5 teeth in a row; interorbital 4 to 4⅕ in head, broadly convex. Gill rakers 4+9, short, rather flexible.

Scales in lateral line 18 or 19, 4+2; 2 scales above lateral line, 6 below, 4 predorsal; single row of 3 or 4 scales on cheek. Scales with 15 to 32 basal radiating striae, apical imperfectly 34 to 39; circuli fine.

D. IX, 10, I, ninth spine 2 to 2⅔ in head, first ray 2 to 2⅖; A. III, 9, I, third spine 3¼ to 4⅛, first ray 2½ to 3⅕; caudal 1¼ to 1⅓, emarginate; least depth of caudal peduncle 1¼ to 1¾; pectoral, 1⅙ to 1¼; ventral, 1½ to 1⅘.

Brown, mottled, or marbled obscurely with darker, also fine whitish dots scattered about and base of each scale with pale area. From eye 3 dark bands radiate forward, 3 above, and 3 behind. Two dark bands across mandible. Vertical fins brown, like body, end of mem-

brane dusky. Soft dorsal blotched with dark. Anal pale brown, with median longitudinal deep brown band, edge and base narrowly dusky. Caudal deep brown, with 5 or 6 deep brownish transverse bands, hind edge narrowly buff. Pectoral pale brown, base deep brown. Ventral dull brown, dusky terminally.

East Africa to the East Indies, Micronesia, Tahiti, and Hawaii. There is no question but that *Calotomus irradians* Jenkins is a synonym.

18677. Cebu market. May 24, 1909. [1467]. Length, 232 mm. General color gray, each scale with reddish basal stripe; stripes above eye orange, none through nostril. Dorsal nearly body-color, with reddish marginal bar and another near base merged in reticulation posteriorly. Three reddish bars on caudal, much broken and diverse. Distinct green shades on head, back, and caudal base.

18602. Tambul Segambul, Tonquil Island. September 14, 1909. Length, 190 mm.

A795. Zamboanga. October 6, 1909. Length, 280 mm.

A1366. Basa Island, Gulf of Boni, Celebes. December 17, 1909. Length, 260 mm. Head dusky bottle green, becoming much darker on back, where rather greenish black; margins of scales dark red, on lower side ground color dusky plum purple, rather pale on breast; on throat greenish gray, from eye lines of dusky geranium radiating backward both up and down and two crossing preorbital to corner of mouth; entire snout and top of head with irregular bars of same color covering more area than green (or ground); large spot below corner of mouth and side of chin, smaller dash posterior; irregular spots on lower cheek and upper opercle. Dorsal body color, crossed by dusky red bar at base and another at margin, marginal bar running down rays on soft part of fin joining into network with lower bar in last five or six membranes. Caudal body color, extreme tip white on dusky line, body of fin much reticulated with broad red lines similar to those on rest of body. Anal similar to dorsal, front and margin slaty and colors otherwise brighter than on dorsal. Ventral similar to adjacent body. Pectoral dark body color, becoming hyaline terminally, mottled with red obscurely on basal part; iris dusky and brassy, inner portion more or less brown.

51097 U.S.N.M. Hawaii. Bureau of Fisheries. 1 example. 358 mm. As *Calotomus sandwicensis.*

55929 U.S.N.M. Jolo. Philippine Commission. 1 example. Length, 255 mm.

5601 U.S.N.M. Zamboanga. Philippine Commission. 1 example. Length, 220 mm.

Genus CALLYODON Gronow

Callyodon Gronow, Mus. Ichth., vol. 2, 1764, p. 8. Species not binomial. Type *Scarus croicensis* Bloch = *Calliodon lineatus* Schneider, designated by Jordan and Gilbert, Bull. U. S. Nat. Mus., vol. 16, 1883, p. 606.

Calliodon Schneider, Syst. Ichth. Bloch, 1801, p. 59. Type *Scarus croicensis* Bloch.

Novacula Catesby, Hist. Nat. Carolina, ed. 2, 1771, p. 18. Species not binomial. Type *Novacula cærulea* Catesby = *Coryphaena coerulea* Forster, monotypic.

Scarus (not Gronow, 1764) Forskål, Descript. Animal, 1775, p. 25. Type *Scarus psittacus* (not Linnaeus) Forskål, designated by Jordan, Rep. U. S. Fish. Comm., vol. 13, 1885 (1887), p. 888.

Mormyra Browne, Nat. Hist. Jamaica, ed. 2, 1789, p. 446. Species not binomial. Type *Mormyra major caerulea* Browne = *Scarus vetula* Schneider, designated by Jordan and Evermann, Genera, of Fishes vol., 1, 1917, p. 46.

Odax (COMMERSON) LACÉPÈDE, Hist. Nat. Poiss., 1802, p. 70. Species not binomial. Type *Odax odon* (COMMERSON) LACÉPÈDE=*Scarus chadri* LACÉPÈDE=*Scarus niger* FORSKÅL, monotypic.

Hemistoma SWAINSON, Nat. Hist. An., vol. 2, 1839, p. 226. Type *Hemistoma reticulatus* SWAINSON=*Scarus pepo* BENNETT, monotypic.

Petronason SWAINSON, Nat. Hist. An., vol., 2, 1839, p. 226. Type *Scarus psittacus* (not LINNAEUS) FORSKÅL=*Scarus ghobban* FORSKÅL, designated by SWAIN, Proc. Acad. Nat. Sci. Phila., 1882, p. 274.

Erychthys SWAINSON, Nat. Hist. An., vol. 2, 1839, p. 226. Type *Scarus croicensis* BLOCH, designated by SWAIN, Proc. Acad. Nat. Sci. Phila., 1882, p. 274.

Chlorurus SWAINSON, Nat. Hist. An., vol. 2, 1839, pp. 226, 227. Type *Scarus gibbus* RÜPPELL, monotypic.

Pseudoscarus BLEEKER, Versl. Akad. Wet. Amsterdam, vol. 12, 1861, p. 230. Type *Scarus microrhinos* BLEEKER, designated by JORDAN and EVERMANN, Bull. U. S. Nat. Mus., No. 47, pt. 2, 1898, p. 1655.

Loro JORDAN and EVERMANN, Rep. U. S. Fish Comm., 1895 (1896), p. 418. Type *Scarus guacamaia* CUVIER, orthotypic.

Body robust. Head moderate. Lower jaw included within upper. Lips variably cover or expose teeth; upper laterally double, inner fold very narrow or not developed medially. Teeth in jaws fully coalesced, surface like mosaic; edges of teeth mostly even. Canines posteriorly very variably present or absent, 1 to 3 or even 4 sometimes present above or below each side. Front nostril without cirrhus; hind nostril sometimes greatly larger than front one. Gill membranes little joined with narrow isthmus, over which they form broad fold. Predorsal scales 6 to 8; cheek with 2 to 4 rows of scales; scales in lateral line 23 to 25. Lateral line interrupted behind, begins again on next or second series of scales below; tubes scarcely branched. Dorsal spines flexible, scarcely distinguishable from soft rays, 9, and rays, 10. Anal spines 3, rays 9.

Species usually large or moderate in size, brilliant and numerous in tropical seas. Their bright colors fading after death, it is often very difficult to determine alcoholic specimens. Authors have given the various shades of white, rose, or green of the teeth as group distinctions, though very unsatisfactory as usually applied to preserved materials.

Callyodon ghobban (Forskål) has been reported by Elera as *Pseudoscarus pyrrhostethus* [23] from Luzon, Cavite, and Santa Cruz.

ANALYSIS OF THE SPECIES

I. PSEUDOSCARUS. Preopercle flange below always scaleless.
  a^1. Cheek with two rows of scales.
    b^1. Lips narrow, usually cover basal half of teeth.
      c^1. Caudal truncate or convex behind; canines small or absent.
        d^1. Head very gibbous or swollen above eyes; uniform chocolate; size large ..... oedema.
        d^2. Head with upper profile little convex; uniform chocolate; size small ..... erythrodon.
        d^3. Body more or less speckled or spotted with whitish ..... margaritus.

[23] Cat. Fauna. Filip., vol. 1, 1895, p. 559.

c^2. Caudal concave behind.
e^1. Dorsals and anals usually with yellow or green longitudinal band medially; lips half cover teeth.
f^1. Yellow or green line from rictus to lower eye edge, sometimes short one above and before or one above and behind eye; canines weak, obsolete or absent---sordidus.
f^2. Large yellow blotch on cheek, includes prepectoral region; canines usually well developed---quoyi.
e^2. Dorsals and anals without median longitudinal band, though sometimes brown one on dorsals; yellow or green band from rictus to lower eye edge and often two short ones back from hind eye edge; lips cover ½ to ¾ of teeth---forsteri.
b^2. Lips cover teeth; canines small or absent; caudal convex or double convex; green or yellow median band longitudinally on dorsals; young with 5 dark blotches on back, with age trunk pale brown and two pale transverse bands at front of anal---mutabilis.
a^2. Cheek with 3 rows of scales.
g^1. Teeth exposed, lips narrow.
h^1. Upper front profile oblique and more or less straight; no green band on side of head, dorsals and anals with median green or yellow streak---microcheilos.
h^2. Upper front profile gibbous above eyes; green band across chin and then from rictus horizontally toward pectoral origin---microrhinos.
g^2. Lips well cover teeth.
i^1. Upper front profile of head straight and oblique; head mostly uniform---harid.
i^2. Upper front profile convex; head and trunk above finely speckled or spotted with rosy or reddish--pulchellus.

II. Callyodon. Preopercle flange below with at least one scale, usually two to 4 [rarely preopercle flange entirely scaleless in *Callyodon dubius*].
a^1. Cheek with two rows of scales.
b^1. Upper profile of head very slightly convex.
c^1. Body without gray or gray-white spots.
d^1. Dorsals with longitudinal median or partly median band.
e^1. Dorsals with green or yellow longitudinal median band; lips cover teeth.
f^1. No canines; preorbital and band from hind eye edge toward pectoral base blackish, broadly edged yellow below; front half of body and head green, hind half red; anal with outer marginal half green---dimidiatus.
f^2. Canines often present; variable greenish radiating lines or streaks from eye and pectoral with dark submarginal band above---fasciatus.
e^2. Dorsals with a yellowish-white submarginal band; whole front of head yellowish green; anal green, with broad white median longitudinal band; each caudal lobe with white median longitudinal band; lips cover teeth---kelloggi.
d^2. Basal half of dorsals green to dusky; canines developed.
g^1. Lips cover teeth; green, hind half of body usually paler; buff band from snout to eye, then back toward pectoral origin---frenatus.
g^2. Lips half cover teeth; yellow band from snout to eye; cheek green; anal with median dark longitudinal band--janthochir.

d^3. Dorsals without median longitudinal band, edges and bases sometimes narrowly blue or green.

h^1. No pale band from eye to suprascapula.

i^1. Five dark bars or blotches on back; no canines; teeth well exposed ..... caudofasciatus.

i^2. No dark transverse bars or blotches on body.

j^1. Yellow line from snout tip to eye and another across lower lip to rictus, then to lower eye edge; sometimes yellow interorbital line ..... dussumieri.

j^2. Green or dusky band from snout tip to eyes, then back horizontally on head; lips cover teeth.

k^1. No canines; fins uniform ..... oviceps.

k^2. Canines present; lower half of anal green or yellow ..... pectoralis.

i^3. No green or yellow line or band from snout tip or rictus to eye.

l^1. Pectoral origin without small dark spot.

m^1. No pale longitudinal lines on side of abdomen.

n^1. Body without dark vermiculations or mottling.

o^1. Body largely uniform brown or olive.

p^1. Pale band across each lip; preopercle scales 2—2 ..... lineolabiatus.

p^2. Dorsals and anals with narrow blue edges; preopercle scales 2—2 ..... balinensis.

p^3. Deep dusky green; preopercle scales 4—4. viridibusius.

o^2. Middle of side of head and body blue. tricolor.

o^3. Cheek with large variable yellowish or greenish blotch and variable yellow spots, lines or blotches on lower surface of head; pectoral blue, with brown or red submarginal band above; canines strong. blochii.

n^2. Head above, trunk and tail with dusky vermiculations ..... rubroviolaceus.

n^3. Head and caudal peduncle and caudal fin pale, only trunk and front of tail dark and with fine dark vermiculations. vermiculatus.

m^2. Side of abdomen with 3 pale or white longitudinal lines ..... dubius.

l^2. Small black spot at pectoral origin; canines seldom present ..... hypselopterus.

h^2. Broad pale or yellow band from upper hind eye edge to suprascapula, sometimes only small pale suprascapular spot or several pale spots remain behind eye; color otherwise largely deep dusky; canines strong ..... nuchipunctatus.

c^2. Body spotted with light gray or whitish; no canines ..... guttatus.

b^3. Upper profile of head gibbous above eye; teeth exposed; no canines; uniform brown ..... muricatus.

a^3. Cheek with 3 rows of scales; lips largely cover teeth; lower portion of head, trunk and tail dark gray, mottled in strong contrast with blackish; fins uniform, vertical ones narrowly edged blue; no canines ..... bicolor.

CALLYODON OEDEMA Snyder

Callyodon oedema Snyder, Proc. U. S. Nat. Mus., vol. 36, 1909, p. 603. Nafa Okinawa; vol. 42, 1912, p. 509, pl. 67, fig. 1 (type).

Depth 2⅛ to 2⅓; head 2⅔ to 3, width 2⅕ to 2⅙. Snout 2⅛ to 2¼; eye 7 to 8⅕, 3⅛ to 4 ⅕ in snout, 2⅕ to 3⅛ in interorbital; mouth cleft 4 to 5 in head; lips ⅓ to ½ cover teeth; no canines; nostrils small, hind one but little larger than anterior; interorbital 2¾ to 3⅛ in head, convex, with elevated rounded prominence above. Gill rakers 20+23, slender, fine, short.

Scales in lateral line 19 or 20, 5+2; 2 scales above lateral line, 6 below, 4 predorsal; 2 rows of scales on cheek, of 5 in lower row, none on preopercle flange. Scales with 29 to 34 basal radiating striae, apical 24 to 28; circuli very fine.

D. IX, 10, 1, ninth spine 2⅕ to 3 in head, first ray 2⅖ to 2½, last ray 2⅛; A. III, 9, 1, third spine 3¾ to 3⅘, first ray 2⅔ to 2⅘, last ray elongated with age; caudal 1⅓ to 1⅖, convexly rounded behind; least depth of caudal peduncle 2$\frac{1}{10}$ to 2⅛; pectoral 1¼ to 1⅓; ventral 1⅕ to 1⅖.

Body deep uniform chocolate. Fins all neutral blackish. Teeth white. Iris yellowish brown.

At present known only from the Riu Kiu Islands and the examples below. The species differs markedly in the swollen occipital crest, somewhat suggestive of a hooded seal, its dark color, and white teeth.

A. 1895 and 8791. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length, 428 to 433 mm.

A. 1389 to A. 1394. Tampotana Island. December 21, 1909. Length, 295 to 432 mm. Canines present as follows: A. 1390, upper, 2—1; lower, 0—0; A. 1391, upper, 0—1; lower, 0—0; A. 1392, upper, 1—1; lower, 0—0; A. 1393, upper, 2—1; lower, 0—0.

62951 U. S. N. M. Nafa, Okinawa. *Albatross* collection. Type of *Callyodon oedema.*

CALLYODON ERYTHRODON (Valenciennes)

Scarus erythrodon Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 255. Mauritius.

Pseudoscarus erythrodon Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 49 (type).—Günther, Fishes of Zanzibar, 1866, p. 107 (Zanzibar).—Day, Fishes of India, pt. 3, 1877, p. 413 (Port Blair).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 319 (East Africa, Ceylon, Pelew Islands, Yap, New Hebrides, Marquesas, Samoa, Raiatea, Tahiti).

?Calliodon lineatus Schneider, Syst. Ichth. Bloch, 1801, p. 312 (on Gronow, Zoophylac., vol. 2, 1763, p. 72, pl. 7, fig. 4).

Scarus cruentatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 277. Ulea.

Scarus sumbawensis Bleeker, Journ. Ind. Arch., vol. 2, 1848, p. 638. Sumbawa.—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 232 (East Indies).

Pseudoscarus sumbawensis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 47, pl. 15, fig. 4 (Batu, Celebes, Sangi, Sumbawa, Timor, Banda).

Pseudoscarus goldiei MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 590. New Guinea.

Pseudoscarus platodoni SEALE, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 96. Agana, Guam.

Depth 2½ to 2⅞; head 2⅖ to 2¾, width 2¼ to 2½. Snout 2⅛ to 3; eye 5 to 8, 1⅗ to 3⅞ in snout, 1¼ to 2⅞ in interorbital; mouth cleft 3⅔ to 5; lips half cover teeth; canines often 1 or 2 above posteriorly, less frequently 1 or none each side below, or all may be absent; interorbital 3 to 3⅖ in head, convex. Gill rakers 12+27, slender, short, flexible.

Scales in lateral line 16 to 18+3 to 8+2; 2 scales above lateral line, 6 below, 4 or 5 predorsal; 2 rows of cheek scales, none on preopercle flange. Scales with 30 to 49 basal radiating striae, imperfect apical 25 to 51; circuli fine.

D. IX, 10, 1, ninth spine 2⅔ to 3⅓ in head, first ray 2½ to 3⅛; A. III, 9, 1, third spine 3⅛ to 3⅔, first ray 2⅞ to 3¼; caudal 1⅗ to 1⅘, slightly emarginate to truncate, convex to double convex as expanded; least depth of caudal peduncle 2⅕ to 2⅗; pectoral 1⅔ to 1⅗; ventral 1¾ to 2.

Dark brown to chocolate brown generally. Most all show dark band along lower lip edge. Fins like trunk or vertical often darker to dusky. Pectoral usually pale brownish or much paler than body color. Iris brown. Teeth pale or light brownish.

Widely distributed from East Africa and Mauritius to the East Indies, Micronesia, the Marquesas Islands, and Tahiti.

In our large series of examples we find some that approach while others agree entirely with *Pseudoscarus gymnognathus*. All very closely resemble *Callyodon erythrodon* and when stained or otherwise discolored are indistinguishable from the typical specimens. Only when two dark lines across the chin and the other across the end of the snout are visible can *P. gymnognathus* be distinguished. In general, such specimens are largely a little paler or lighter. The average are more or less deep mars brown or wood brown, often slightly clouded and lower surfaces scarcely paler. Many examples have a distinct chocolate tinge. Fins brownish, often both dorsals with median gray brown area longitudinally, fin edge with neutral dusky line. Anals often grayish, with basal and marginal neutral-dusky lines their whole length. Other fins uniform.

Callyodon sordidus is also very similar, except for the presence of the dark band on the lips. The lips in both are very narrow so that the jaws are greatly exposed. The presence of posterior canines, though occasional, is not a valid distinction. The dark chocolate color of many examples is equally matched with undoubted specimens of *C. sordidus*. Still we have left the present materials with *C. erythrodon*, if only provisionally. The canines, when occasionally

present, are very small, often only rudiments. Some examples show the caudal and head pale though all have pale or whitish teeth. Often the teeth of *C. sordidus* are deep green.

9625, 11095, 11097, 11099, 11102 to 11104. Agojo Point, Catanduanes Island. June 10, 1909. Length, 140 to 197 mm. (11095, canines, upper, 1—1; lower, 0—0; 11099, canines, upper, 1—1; lower, 0—0; 11102, canines, upper, 1—0; lower, 0—0; 11103, canines, upper, 1—1; lower, 0—0; 11104, canines, upper, 1—1; lower, 0—0).

5047 and 5050. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 132 mm. [1228.] Teeth dusky; body colors about as in adult; margin of dorsal and anal very narrowly blackish; more or less defined bar of reddish at base in small specimens; caudal regions with olive shades; tip of caudal fin black, extreme margin whitish.

8101 and 8102. Alimango Bay, Burias Island. March 5, 1909. (8101, canines, upper, 2—1; lower, 0—0; 8102, canines, upper, 1—1; lower, 0—0.) Length, 213 to 228 mm. Teeth very dusky rose; lips scarlet; dark band behind lower lips and interrupted one across back of chin; no bars on fins; in life some apparently show caudal, caudal peduncle, and fin with various shades or degrees of lighter; some apparently show pale bars across side.

11195, 11951, 11953. Alimango Bay, Burias Island. March 5, 1909. Length, 134 to 195 mm. [1217.] Very dark brownish on top of head and back; lower head and breast lake-red shades; teeth dusky rose; lips bright red, also chin; very indistinct darker bar behind chin; fins without crossbars except slightly darker margin on dorsal and anal; caudal peduncle and fin apparently somewhat paler with darker area at base.

8916. Atulayan Island. June 18, 1909. Length, 237 mm. (Canines, upper, 1—1; lower, 0—0.)

11063 and 16805. Butauanan Island. June 12, 1909. Length, 172 to 199 mm (16805, canines, upper, 1—1; lower, 0—0.)

11064. Butauanan Island. June 13, 1909. Length, 156 mm.

16358. Biri Channel. June 1, 1909.

9936, 12120, 12122, 12124. Biri Channel. June 2, 1909. Length 94 to 210 mm. (12120, canines, upper, 5—1; lower, 0—0; 12122, canines, upper, 1—1; lower 0—0; 12124, canines, upper, 1—1; lower 0—0).

8661. Biri Channel, Balicuatro Island. June 22, 1909. Length, 199 mm. Slaty gray; teeth dusky rose; fins without distinct markings; body with whitish spots; top of head with bronzy specks.

8659, 8663, and 8665. Biri Channel. June 22, 1909. Length, 34 to 200 mm. (8659, canines, upper, 2—2; lower, 0—0; 8663, canines, upper, 1—1; lower, 0—0.)

5438 and 5439. Off Bohol. April 8, 1908. Length, 205 to 225 mm. General color purplish brown, more red below anteriorly. Teeth rosy. Lips dull scarlet, slaty bands posterior on both snout and chin. These fish found in schools like groupers and would run off the reef into deep water under the boat. Would come to the surface when dynamited.

7452, 7456, 7457. Bolalo Bay, Palawan Island. December 21, 1908. Length, 213 to 260 mm. (7452 and 7456, canines in both, upper, 1—1; lower 0—0.) [7452.] Olive to dusky brown; scales of sides with brown vertical bar at base, most distinct posteriorly; lips dull scarlet; chin band of same; teeth dusky rose; dorsal crossed by two bands of same color as body; anal same, but less distinct; edges of both narrowly slaty. [7456.] Teeth dusky; general color very dark brown; obscure reddish narrow lips and chin band; dorsal crossed by two slaty bands, seen best by transmitted light; anal similar; vertical fins of dark reddish brown; paired fins paler, not marked.

17866. Buang Bay, Talajit Island. March 15, 1909. Length, 196 mm. [1365.]

22180. Bubuan Island, Jolo. February 14, 1908. Length, 116 mm.

5657, 5660, and 5661. Busin Harbor, Burias Island. April 22, 1908. Length, 213 to 242 mm. (5657, canines, upper 2—2; lower 0—0; 5660, canines, upper, 1—1; lower, 0—0; 5661, canines, upper, 1—0; lower 0—0.) Very dark olive; teeth pale rosy, edges dusky; lips narrowly red; slaty band behind lower lip, sometimes interrupted; lower head and breast pale claret brown; slaty bar across front of interopercle; no throat stripe; dorsal uniform claret, dusky-green shades of front and margin narrowly darker; caudal similar; anal similar; paired fins pale claret brown; front of ventral slightly slaty; iris golden; side after fading becomes gray, each scale showing broad vertical claret bar at base.

5602 and 5603. Busin Harbor, Burias Island. April 22, 1908. Length, 141 to 162 mm. (Canines, upper, 1—1; lower, 0—0.) Scales grayish, perhaps from fading; scales with fairly broad vertical bars of brownish or claret; teeth dusky at edges, rosy at bases, lips reddish, full gray band behind lower lip on chin, followed by another band of reddish to corner of mouth; dorsal very dull orange, front and edge dark, narrowly with obscure greenish band through center; caudal rays more or less orange, membranes slightly dusky; anal similar to dorsal but darker, slaty at base; paired fins more or less orange; ventral tipped with blackish, slaty front; pectoral more or less hyaline below, upper ray dusky; iris golden.

5604. Same data. Length 172 mm. (Canines, upper, 1—1; lower, 0—0.) Gray; claret shades appearing rather as an edging about scales; teeth similar to 5602 and 5606; lips narrowly orange; slaty gray band behind lower lip, with red band behind somewhat interrupted, central portion appearing as roundish spot within backward projection of gray band; gray and reddish behind as in 5605; fins similar to 5602 and 5603.

5605. Same data. Length, 168 mm. (Canines, upper, 1—1; lower, 0—0.) Similar to 5602 and 5603, but reddish bars on scales slightly broader.

5606. Same data. Length, 218 mm. (Canines, upper, 1—1; lower 0—0.) Reddish bars on scales less pronounced. Edges of teeth dusky, bases rosy; lips reddish, projection from lower backward on chin (in 5605 reaches second reddish chin band, thus interrupting slaty chin band); in 5606 slaty chin band curves backward around projection interrupting red band; in both second slaty band downward from cheek and suffusing with reddish behind on interopercle. Dorsal orange, front and margin dark; more or less double band of greenish across body of fin; not marked in 5605. Caudal dusky on tip; rays in 5606 orange, little marked in 5605. Anal similar to dorsal, with more of greenish at base. Pectoral more or less orange dusky around tips, duskiness marked in 5605; upper portion of pectoral orange, dusky below; first ray blackish. Iris golden, with some greenish above orbit.

5607 to 5609. Same data. Length, 182 to 227 mm. (Canines in all, upper, 1—1; lower, 0—0.) Darker than preceding, claret shades in 5607 and 5608 appearing as bars; in 5609 rather as scale edges. Teeth dusky at edge, rosy basally. Lips very narrowly reddish; gray chin band, second red band posteriorly; in 5609 gray band interrupted by red crossbar between lip and red band. Dorsal more or less orange, with dusky front in 5607; margin and central band greenish; in 5608 dorsal largely uniform body-color or more reddish; in 5609 ground color of fin similar to 5608 but with 2 narrow bands through body. Anal like dorsal in 5609; likewise 5608 and 5607. Caudal with orange shade on rays. Paired fins more or less like body color, upper portion of former more orange and top ray blackish. Iris golden in all.

5648. Busin Harbor, Burias Island. April 23, 1908. Length, 204 mm. (Canines, upper, 1—1; lower, 0—0.) Light dusky emerald, becoming paler to about gray on breast; light reddish brown bar at bases of scales; top of head green, with many irregular bars of reddish; teeth dusky, with very slight rosy shades; lips narrowly pink (red before fading, perhaps); broad blue chin band becoming green above; green band behind upper lip which joins bluish and green band of front of interopercle and passes upward across preorbital under eye; red parallel passes narrowly under eye; another green bar across preorbital above red; blue throat band; dash of blue on interopercle, behind front band, remainder more or less lavender. Front and margin of dorsal narrowly dusky blue, base brighter blue under scales, body of fin reddish and narrow blue band through center above. Beginning at fourth spine row of round spots, becoming diffuse posteriorly. Caudal rays red, membranes blue. Anal similar to dorsal, central band not reaching last ray; last half-ray of both dorsal and ventral blue from base. Ventral lavender reddish, front blue. Pectoral dusky, becoming orange, shades most prominent above; first ray dusky blue. Iris golden.

5651. Same data. Length, 198 mm. Olivaceous gray, becoming somewhat lavender below, with more reddish shades on breast; scales with broad claret brown bar at base; top of head greenish, with reddish shades radiating about top of eye; teeth uniform rosy; lips narrowly red; slaty blue stripe across top of snout with orange shades behind; slaty band behind lip on chin, with backward projection on median line and broadly red behind. Pale slaty gray line on throat, not connected with red band; chin otherwise reddish; slaty dash on either side at interrupted band; these slaty areas defined from red by darker line; interopercular region slaty, with suffusion of reddish; reddish band across preorbital from corner of mouth, extending lip colors to eye, and obscurely under and behind eye, obscure red dash behind. Dorsal reddish, brightest at base, front and margin narrowly slate, with diffuse dusky greenish band at center. Caudal rays slightly reddish, tip and edges dusky. Anal reddish, front tip and base slaty gray; diffuse dusky area through center. Paired fins dusky reddish. Ventral and top of pectoral slaty. Iris golden.

18767. Busin Harbor. March 7, 1909. Length, 165 mm.

7193, 22784, 22785. Busin Harbor. March 8, 1909. Length, 180 to 190 mm. (7193, canines, upper, 1—1; lower, 0—0; 22784, canines, upper, 1—2; lower, 0—0.)

22179. Butauanan Island, Jolo. February 14, 1908. Length, 117 mm.

10597. Cabugan Island, Hinunangan Bay, Leyte Island. July, 1909. Length, 163 mm. [1771.]

1114. Cabugan Island, Hinunangan Bay, Leyte. Length, 220 mm. [1769.] Slaty stripes on dorsal distinct, outer one broken; anal similar, outer portion of caudal peduncle and fin distinctly paler.

19037 and 19039. Cagayan, Sulu Island. January 8, 1909. Length, 125 to 146 mm. [1072 to 1074.] Teeth white. Body smoky olive. Fins uniform, with purplish shades.

5436 and 5437, 6271, 6275, 6281. Candaraman Island, Balabac. January 4, 1909. Length, 123 to 252 mm. (5436, canines, upper, 2—1; lower, 0—0; 6271 [1031]; 6275 [1029]. [1031.] Teeth dusky, some reddish; red lips and chin band; obscure reddish bar near margin and at base of dorsal; similar at anal; general coloration when much faded grayish, probably dark brown in life. [1025 to 1029.] Dark teeth rosy; upper lip, chin, and lower head more or less scarlet.

9241. Camp Overton, Mindanao. August 6, 1909. Length, 230 mm. (Canines, upper, 2—1; lower, 0—0.) Fins without slaty bands. Dorsal and anal reddish to vinaceous, more intense near base and submarginally. Back with four or five obscure dusky saddles, about equal or broader than interspaces. Pectoral more intense above.

7769. Candaraman Island. January 4, 1909. Length, 239 mm. Claret brown. Lips and chin bright red. Teeth dusky rose.

8112, 13022, 13171. Cataingan Bay, first anchorage. April 17, 1908. Length, 117 to 248 mm. (8112, canines, upper, 2—1; lower, 0—0; 13022, canines, upper, 0—1; lower, 0—0.)

21176. Catbalogan, Samar. April 15, 1908. Length, 180 mm. (Canines, upper, 1—1; lower, 0—0.)

7776. Catbalogan. April 17, 1908. Length, 243 mm. (Canines, upper, 0—1; lower, 0—0.)

5535. Cataingan, Masbate Island. April 17, 1908. Length, 203 mm. (Canines, upper, 0—1; lower, 0—0.)

17475 and 17478. Canmahala Bay, Ragay Gulf. April 11, 1909. [1312, 1311.]

259. Caxisigan Island, near Balabac. January 2, 1909. Length, 140 mm. (Canines upper, 2—2; lower, 0—0.) [1018.] Teeth rosy; upper lip and chin scarlet; apparently no bars on fins; general color more or less gray or claret.

8413. Cebu market. March 20, 1909. Length, 235 mm. (Canines, upper, 2—2; lower, 0—0.)

5322. Cebu market. April 4, 1908. Length, 260 mm. (Canines, upper, 2—1; lower, 0—0.) Teeth reddish; lips red, smoky behind and over top of head above; smoky band on chin interrupted in center; second behind more obscure running back on mesial line; lower head and breast reddish. Dorsal and anal body color, tips darker. Caudal body color, rays more red. Ventral and pectoral reddish, upper edge and front smoky. Iris golden.

1 example. Cebu market. September 4, 1909. Length, 78 mm.

17722. Cuyo, Cuyo Island. April 9, 1909. Length, 127 mm.

15106. Dupon Port, Leyte Island. March 17, 1909. Length, 208 mm. (Canines, upper, 2—2; lower, 0—0.) [1386.]

7576. Endeavor Strait, Malampaya Sound, Palawan Island. December 23, 1908. Length, 230 mm. (Canines, upper, 1—1; lower, 0—0.) Body dark. Teeth dusky rose. Lips and chin band red.

16641. Galera Bay, Mindoro. June 9, 1908. Length, 175 mm. (Canines, upper, 0—1; lower, 0—0.)

4668. Galvaney Island, Ragay Gulf. March 9, 1909. Length, 198 mm. (Canines, upper, 1—1; lower, 0—0.)

6806 and 7278. Gigoso Point, Quinapundan Bay, Samar Island. July 28, 1909. Length, 161 to 193 mm. [1725.] Dark brown, scales veined with blackish, bases reddish; teeth dusky, lips red; two slaty bands across chin with red between. Dorsal reddish brown by transmitted light showing two distinct slaty bars which divide ground color into three equal parts. Caudal rays reddish, membranes slaty. Anal similar to dorsal, with single broader bar through center, slaty tip and base. Dorsal margin of slate very narrow, much narrower than anal, slaty blotches at base of spinous membranes distinct, mostly beneath the soft sheath. Paired fins dark, pectoral membranes hyaline, fins without distinct markings.

13284. Great Tobea Island. December 14, 1909. Length, 182 mm. [2137.] Teeth dusky white. General color dusky olivaceous, brown to dark red brown. Lips pale reddish, lower very narrowly, then slaty; chin red brown and along interopercle edge; slaty bar behind chin, along throat and above brown on interopercle. Dorsal front and edge narrowly slate, body of fin reddish brown, dark greenish in middle of membranes and brown in rays and top. Caudal brown, two olive green to dusky basal bars, edges of fin slaty. Anal like dorsal with central bar rather slaty and margin wider. Ventral red brown and slaty. Pectoral dusky brown. Iris olive and silver.

12904. Great Tobea Island, Dutch East Indies. December 14, 1909. Length, 177 mm. (Canines, upper, 1—1; lower, 0—0 [2143].) Teeth dusky rose; lips pale vermilion; slaty band on chin; dorsal with narrow slaty edge and suggestion of submarginal and basal stripe of reddish; caudal without bars.

11653. Tulnalutan Island. September 9, 1909. Length, 188 mm. (Canines, upper, 1—2; lower, 0—0.)

6361 and 6362. Jamelo Bay. July 13, 1908. Length, 204 to 232 mm. (6361, canines, upper, 1—1; lower, 0—0; 6362, canines, upper, 1—1; lower, 0—0.) General color brown. Teeth dusky red. Lips narrowly red, with slaty bands.

5174 Jolo. March 7, 1908. Length, 230 mm. (Canines, upper, 1—2; lower, 0—0.) Very dark, with claret shades. Lips red. Teeth pink at base. Scales posteriorly with narrow vertical claret bar at base.

4921. Same data. Length, 165 mm.

7651. Same locality. February 12, 1908. Length, 188 mm.

A. 1339. Labuan Blanda Island. December 14, 1909. Length, 219 mm. (Canines, upper, 1—1; lower, 0—0.)

5733 to 5735. La Generale Island, Capunuypugan Island. May 9, 1908. Length, 157 to 220 mm. (5734, canines, upper, 1—1; lower, 0—0.)

9004 and 9007. Langao Point. June 24, 1909. Length, 242 mm. (9004, canines, upper, 1—1; lower, 0—0; 9007, canines, upper, 1—1; lower, 0—1.)

5023. Lagoon Anchorage, South Tumindao. February 26, 1908. Length, 141 mm.

9001 and 9002, 9013 to 9018. Langao Point, Luzon. June 24, 1909. Length, 136 to 273 mm. (9001, canines, upper, 2—2; lower, 0—0; 9002, canines, upper 1—1; lower, 0—0; 9017, canines, upper, 1—1; lower, 0—0.)

12965 and 13346. Langao Point. June 24, 1909. Length, 178 to 182 mm. (12965, canines, upper, 1—1; lower, 0—1.)

9823, 11973 to 11975, 11977, 11980 to 11983. Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 121 to 217 mm. (9823, canines, upper, 1—1; lower, 0—0; 11973, canines, upper, 1—1; lower, 0—0; 11977, canines, upper, 1—1; lower, 0—0; 11981, canines, upper, 1—1; lower, 0—0.)

11976, 18543. Little Santa Cruz Island. May 28, 1908. Length, 124 to 125 mm.

6076, 6078 to 6080. Little Santa Cruz Island, Zamboanga. May 28, 1908. Length, 143 to 203 mm. (6076, canines, upper, 0—1; lower, 0—0; 6080, canines, upper, 2—2; lower, 0—0.) (6076.) Very dark reddish brown. Lips orange, slaty band posterior. Teeth reddish. (6079.) Like above but without chin band. (6080.) Teeth whitish. Upper lip narrowly orange. Snout bright yellowish-green; top of head green, with pink mottling; lower lip blue; chin geranium pink, bluish green posterior; throat blue. Fins edged blue. Base of dorsal, ventral, and anal greenish red or orange between and blue edge. Stripe reddish within blue edge of caudal lobe, fin yellowish green medially. Ventrals reddish, first and last rays blue. Pectoral greenish, broad purplish stripe in upper portion ending in blackish. Body colors much faded, probably green and geranium.

5956 to 5960. Little Santa Cruz Island. May 26, 1908. Length, 194 to 250 mm. (5956, canines, upper, 0—1; lower, 0—0; 5957, canines, upper, 1—1; lower, 0—0; 5958, canines, upper, 1—1; lower, 0—0; 5959, canines, upper, 2—1; lower, 0—0; 5960, canines, upper, 0—1; lower, 0—0.) Claret brown fading to olivaceous, brownish bar at base of scales. Teeth whitish, on edge, reddish basally. Lips red. Chin with slaty crossband. Fins uniform.

15202, 8439, 8440, 8441. Mactan Island. March 25, 1909. Length, 191 to 227 mm. (8439, canines, upper, 0—1; lower, 0—0; 8440, canines, upper, 2—1; lower, 0—0; 8441, canines, upper, 1—1; lower, 0—0.)

5403, 5412, 5413. Mactan Reef. April 6, 1908. Length, 180 to 195 mm. (5403, canines, upper, 2—1; lower, 0—0.) Seal brown, with greenish shades above, prune purple below; lips narrowly red; band of slate behind lower on chin, reddish and again slate; dorsal with brownish shades, dark on front and tip and obscurely dark through center; caudal greenish, rays purplish; anal purplish, dark at tip and base; paired fins brownish, first ray or spine in each slaty; iris golden; lips pink. (5412, canines, upper, 1—1; lower, 0—0.) Olivaceous; probably with reddish margins to scales; teeth reddish; lips very thinly red; very narrow reddish chin band in pale field; about 3 reddish bars on dorsal, 2 on anal; rays of caudal reddish; paired fins with reddish shades. (5413, canines, upper, 1—2; lower, 0—0.) Olivaceous; lips reddish; red chin band through pale field; teeth rosy; traces of reddish vertical bars in fins; reddish line under edge of dorsal, another at base; anal and dorsal dusky; edges of vertical fins reddish.

14575. Maculabo Island. June 14, 1909. (Canines, upper, 1—1; lower, 0—0.)

6141 to 6143. Mansalay. June 4, 1908. Length, 225 to 230 mm. (Canines, all, upper, 1—1; lower 0—0.) (6141 and 6142.) Teeth dusky; no slaty chin band; body brown, centers and bases of scales of upper posterior side reddish brown; caudal red; dorsal dark, with red bar on terminal fourth and similar bar on second fourth, margin blackish; anal with reddish shades; terminal half of pectoral yellow. (6143.) Chin band slaty and second band posterior includes throat. Teeth reddish. Caudal not red.

6145. Mansalay. June 4, 1908. Length, 85 mm. Upper lip narrowly orange. Snout and chin bright bluish green. Teeth white. Interorbital and postorbital region slaty. General body color green, with claret shades on margins of scales posteriorly.

6149. Same data. Length, 247 mm. (Canines, upper, 2—2; lower, 0—0.) Lips narrowly red. Teeth dusky reddish. Chin band slaty. Dorsal without bars.

5440, 5441. Mantacao Island. April 8, 1908. Length, 145 to 260 mm. (Both canines, upper, 1—1; lower, 0—0.)

19914. Maribojoc Bay, Maribojoc, Bohol. March 26, 1909. Length, 122 mm.

6527. Maricaban Island Reef. July 21, 1908. Length, 270 mm. Teeth dusky rosy. Lips narrowly red. Chin bars slaty. General colors brown.

6535, 6537, 6538. Same data. Length, 209 to 249 mm. (6535, canines, upper, 1—0; lower, 0—0; 6537, canines, upper, 2—0; lower, 0—0; 6538, canines, upper, 2—2; lower, 0—0.) Teeth dusky rosy; tip of nose and chin, including lips, scarlet, shading below into duller reds, and on top of head into blackish olive; general color brownish olive shades, very dark; fins similar to body, without markings; scales with brownish bar or spot near base, becoming distinct on fading; some of lower scales with obscure pale mottling.

16617. Maribojoc Bay, Bohol Island. March 26, 1909. Length, 145 mm. [1479.] Dorsal showing slight intensification of color at base and margin to form obscure bars; teeth and chin as usual.

5565 to 5567. Masbate Reef. April 20, 1908. Length, 208 to 227 mm. (5565, canines, upper, 2—2; lower, 0—0; 5566, canines upper, 0—1; lower 0—0; 5567, canines, upper, 1—1; lower, 0—0.) Claret-brown. Teeth rosy at base. Lips and chin band red; chin slaty.

8595. Matnog Bay. May 31, 1909. Length, 240 mm. (Canines, upper, 1—1; lower, 0—0.)

9307, 11350, 17442. Mompog Island, near Marinduque Island. March 3, 1909. Length, 130 to 225 mm. [1200.] (17442, canines, upper, 1—2; lower, 0—0.) General color brown, but not so dark as in type called fuscus; teeth dusky rose; upper lip slaty, then brown bar, then a slaty bar, which continues backward to eye; lower lip slaty, bar of same color across chin. On fading central area of scales

of side and back becomes more or less olivaceous, with reticulation of darker lines; base narrowly brown. Front and margin of dorsal slaty, body of fin reddish-brown with dark olive bar through center, this continued through spinous portion, not showing on rays of soft portion. Caudal reddish brown, one or two obscure bars near base. Anal front and margin slaty, body of fin dark red brown; median bar of very dark olive. Ventrals reddish, fronts pale slaty. Pectorals reddish brown, membranes more or less hyaline. Iris with some golden, eyeball dark above.

9337. Murcielagos Bay, Mindoro. April 21, 1909. Length, 240 mm. (Canines, upper, 0—1; lower, 0—0.)

9276. Murcielagos Bay. August 9, 1909. (Canines, upper, 1—1; lower, 0—0.)

9332. Murcielagos. August 20, 1909. Length, 229.

7491 and 18585. Murcielagos Bay. August 21, 1909. Length, 156 and 202 mm.

7959 and 7960. Pagapas Bay. February 20, 1908. Length, 233 to 258 mm. (7959, canines, upper, 1—1; lower, 0—0.)

15674. Palag Bay. June 16, 1909. Length, 145 mm.

15505. Pandanon Island. March 24, 1909. Length, 168 mm. (Canines, upper, 0—1; lower, 0—0.) [1438]. Teeth white or pale rosy; lips reddish; top of head and back dark olive gray; top of head with numerous small brownish spots showing only after ground color fades; throat and breast with claret wash; scales of side with brownish margin; fins more or less claret, margins of dorsal and anal slaty; pectoral somewhat orange distally; caudal peduncle pale, with darker central blotch near base of fin, may show white in life with dusky blotch.

3 examples, Pandanon Island. March 29, 1909. Length, 58 to 61 mm.

12867 and 12868, 13109. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length 183 to 193 mm. (12868 and 13109, canines, upper, 1—1; lower, 0—0.)

1 example, Philippines. Length, 185 mm.

5086. Polloc. May 22, 1908. Length, 213 mm. Claret brown. Lips scarlet. Smoky-purple chin, band extending in to throat. Teeth white at edge, reddish basally.

8178 to 8185. Port Busin, Burias Island. March 8, 1909. Length, 228 to 235 mm. (8178, canines, upper, 2—1; lower, 0—0; 8184, canines, upper, 1—1; lower, 0—0.) Dark brown, with greenish shades; no apparent bars in dorsal or anal; teeth pale rose; lips scarlet, with slaty bar behind lower and obscure bar behind chin; pectorals body color, but with more distinctly red shade; smaller fish (8184) when first taken showed very pale caudal peduncle and fin; became almost dark as remainder shortly after death; dorsal showed by transmitted light two narrow slaty bars dividing fin into about five parts; otherwise apparently no differences.

8201 and 8202. Same data. Length, 228 to 234 mm. (8202, canines, upper, 1—1; lower, 0—0.)

8442 and 15848. Port Dupon, brackish river, Leyte. March 17, 1909. (8442, canines, upper, 1—0; lower, 0—0; 15848 [1384].) Teeth dusky rose; lips and chin with scarlet, latter with dull bands; fins without bars.

6945. Port Galera, Mindoro. June 9, 1908. Length, 177 mm.

6359. Port Jamelo. July 13, 1908. Length, 180 mm. (Canines, upper, 2—2; lower, 0—0.)

7222. Port Matalvi. November 22, 1908. Teeth dusky rose. Fins plain, or with very obscure central bars. General coloration dusky. (Canines, upper, 1—0; lower, 0—0.)

4605. Port Palapag. June 3, 1909. Length, 151 to 165 mm. (Canines, upper, 1—1; lower, 0—0.)

750. Port Usin, west of Pinas Island. December 17, 1908.

12646. Port Palapag, near northern Samar. June 3, 1909. (Canines, upper, 1—1; lower, 0—0 [1583.].) Teeth dusky; head with bluish stripes and bands on slightly reddish ground, top of head mottled; general body color dusky, with margins of scales more reddish; dorsal and anal fronts and margins slaty, bodies reddish with distinct slaty band through upper portion of lower half and more obscure row of dots or spots through outer half; caudal rays reddish, membranes slaty.

5080, 5801, 5806 to 5807. Pujada Bay. May 15, 1908. Length, 182 to 227 mm. (5801, 5807 to 5809, all with canines, upper, 1—1; lower, 0—0; 5806, canines, upper, 1—0; lower, 0—0.) Centers of scales on back dark green, with olive shades; heliotrope purple bar at base; lower portions, breast, and belly heliotrope purple; lower head similar, but with more red; teeth white on edge, base reddish; lips narrowly dull scarlet, narrow antwerp blue line above, and lighter blue below, continued backward as median throat line; short bar in front of interopercle not reaching margin; lip color extending upward as preorbital bar, passing under eye and suffusing upper portion of opercle; reddish shades above eye in front and behind; top of head dark green; preorbital line bordered on either side by dark green; cheek and opercle below greenish brown. Dorsal front and margin slaty, base and last ray green; body of fin dull orange, becoming purplish posteriorly below; central bar dull green. Caudal greenish, lobes with purple. Anal front and margin slaty, base green; centrally reddish heliotrope. Ventral reddish heliotrope, fronts slaty blue. Pectoral dull olive, upper ray slaty and with stripe of red through upper half. Iris golden.

7497, 7500, 7502 to 7505. Pujada Bay, Mindanao. May 15, 1908. (7500, canines, upper, 0—1; lower, 0—0; 7502, canines, upper, 2—1; lower, 0—0.) [626, 629 to 632.]

10745 to 10747, 21352. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 158 to 191 mm. (10745, canines, upper, 2—1; lower, 0—0; 10747, canines, upper, 1—1; lower, 0—0.)

12598 and 13282. Rapurapu Island. June 22, 1909. Length 174 to 180 mm. (12598, canines, upper, 1—1; lower, 0—0; 13282, canines, upper, 1—2; lower, 0—0.)

5282, 5284 to 5286. Romblon. March 25, 1908. Length, 197 to 259 mm. (5282, canines, upper, 2—1; lower, 0—0; 5284 and 5285, with canines, upper, 1—1; lower, 0—0.) [5282, 5285, 5286.] Smoky hooker green above, irregularly barred with about four darker areas on side; scales with dusky claret bar at base; lower portions with pale claret wash; top of head uniform dusky green; lips orange red; teeth same color, but paler; band of slaty across nose behind lip and behind lower lip on chin; second broken band of same color on chin and longitudinally along to isthmus; obscure orange line from eye downward to corner of mouth. Dorsal tipped with slate, centrally dusky green, same as back; front and submarginal bar of dusky orange; basal bar of dusky vermilion. Caudal narrowly tipped with white and black line; membranes greenish, as body; rays dull purplish claret. Anal front and margin slaty, basally blackish green; main portion centrally dusky flesh, approaching vermilion, mottled with blackish; vertical fins similar to central portion of anal, front and margins of ventrals blackish. Top of pectoral same distally and below becoming hyaline. Iris golden. [5284.] Dusky green above, vinaceous below; scales with dusky claret vertical bar at base on sides; sides more or less blotched and barred with darker; fins with claret shades, paired fins brightest; teeth pink, cutting edge white; lips geranium pink; chin band slaty blue; no other marked stripes on head; iris golden; soft anal and dorsal narrowly margined with dusky; front of ventral same.

7053 and 7054. Romblon Harbor. March 25, 1908. Length, 197 to 237 mm. (7053, canines, upper, 1—1; lower, 0—0; 7054, canines, upper, 2—2; lower, 0—0.) [7053.] Teeth dusky rose. General color brownish, reddish brown at bases of scales. Lips very narrowly reddish, chin band same color. Dorsal and anal reddish brown, with blackish slate markings and two narrow dull indigo lines and bars dividing ground color of fin into about three equal portions. No bars on caudal. Paired fins near body color.

22507. Romblon. March 26, 1908. Length, 183 mm. [483.] Greenish black, indistinctly barred with broad darker areas; base of scales with brown vertical bar obscured as rule by general color; lips narrowly orange, with slaty chin stripe and orange behind; reds on lower lip nearly scarlet. Fins all slaty, with more or less purplish tinge; upper portion of caudal more distinctly brownish. Iris with silvery.

487 and 488. Romblon. March 26, 1908. Length, 95 to 104 mm. Dark smoky green; lips pale reddish, slaty band behind lower on chin, followed again by reddish; teeth white on edge, basally pinkish.

5943 and 14096. Sabtan Island. November 8, 1908. Length, 165 to 216. (5943, canines, upper, 2—2; lower, 0—0; 14096, canines, upper, 1—0; lower 0—0.)

7301. Sablayan, Mindoro. December 12, 1908. Length, 190 mm. Pale green teeth; narrow orange lips, with narrow green stripe over snout and dividing green stripe across side of head; on lower cheek yellowish bar behind chin; dorsal and anal with blue front and margin, orange body, blue at base, green central bar; purple in center of pectoral.

7306. Sablayan, Mindoro. December 12, 1908. Length, 193 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth dusky rose; lips narrowly scarlet; two slaty bands across chin; general coloration reddish brown; fins similar, no bars.

5591 and 5592. San Miguel. April 21, 1908. Length, 194 to 200 mm. (5591, canines, upper 0—1; lower, 0—0; 5592, canines, upper, 1—2; lower, 0—0.) Lips red; teeth pale at edges, rosy at base; blue chin and nose stripes; cheek greenish; without orange on anterior back and upper head; orange central portion of anal much broader; orange stripes of caudal less differentiated; central greenish band of dorsal more diffuse.

5577 and 5578. San Miguel. April 21, 1908. Length, 190 to 200 mm. (5578, canines, upper, 2—1; lower, 0—0.) Seal brown; teeth with dusky edges, red at base; lower lip narrowly red, upper more narrow; slaty band behind lower lip extending down throat; obscurely reddish behind band; fins body color, with more purplish shades; pectoral membranes bright red in upper half. Iris golden.

7652. San Roque, small stream, Leyte. June 29, 1909. Length, 198 mm. (Canines, upper, 1—2; lower, 0—0.) [1752.]

5784. Simaluc, Sulu Island. September 22, 1909. Length, 190 mm. [1981.] Same as 1982, with white spots less pronounced, and showing distinct dusky blotch in base of caudal.

A. 649 and A. 650. Simaluc. September 23, 1909. Length, 233 to 280 mm. (A. 649, canines, upper, 1—1; lower, 0—0; A. 650, canines, upper, 2—1; lower, 0—0.)

15836 and 22756. Sitanki Reef, northwest of Tumindao Island. Length, 110 to 115 mm. [1991.] General color showing some whitish specks or spots along side, front and margin of dorsal blackish, inframarginal and basal reddish lines obscure but apparently present; caudal peduncle pale, with dusky blotch at base of fin.

5017 to 5019. Surigao, Mindanao. May 8, 1908. Length, 143 to 200 mm. Three examples. (5017, larger, with canines, upper, 2—2; lower, 0—0.) [5019.] Olivaceous above, centers of scales dark, lower parts washed with dusky red; upper lip pale olive green, lower lip bluish; narrow blue band back of chin; posteriorly and on caudal peduncle lemon yellow wash; minute black blotch on shoulder. Dorsal with dusky orange shades centrally, becoming more pinkish basally and lemon on posterior rays; front and edge with blue band fading into hyaline on posterior rays. Caudal dusky lemon yellow. Anal pink, broadly banded with pale blue on front and edge; black blotch on three anterior rays. Ventral pink, with blue on front. Pectoral hyaline straw color, with dusky on upper base. Iris reddish.

A. 827 and 15941. Talisse Island. November 9, 1909. Length, 155 to 223 mm. (A. 827, canines, upper, 1—1; lower, 0—0.)

12698. Tara Island. December 14, 1908. Length, 110 mm.

4927. Tataan, Simaluc Island. February 20, 1908. Length, 197 mm. Reddish brown on lower head, breast, and belly; dark geeenish above and posteriorly, crossed by four darker saddles; vertical red bar at base of each scale; lips narrowly scarlet; dusky slate behind, both above and below, continued as longitudinal line on junction of branchiostegal membrane; dull scarlet band on chin, slaty behind; teeth pink. Dorsal reddish brown, narrowly edged with slate; anal same, with broader edge; caudal similar; ventral same, with front edge slate; pectoral similar, top edge dark. Iris golden.

4941. Tataan, Tawi Tawi Island. February 20, 1908. Length, 197 mm.

4973, 4970. Tataan. February 21, 1908. Length, 190 to 243 mm. (Both with canines, upper 2—1; lower, 0—0.) Purplish black; teeth pinkish; lips very narrowly brownish red with darker line behind on chin. [4973.]

A. 563. Teomabal Island. September 18, 1909. Length, 290 mm. (Canines, upper, 1—1; lower, 0—0.)

18776. Tictauan Island. September 8, 1909. Length, 146 mm.

6422. Tilig, Lubang. July 14, 1908. Length, 243 mm. (Canines, upper, 2—2; lower, 0—0.)

10399. Tilig, Lubang Island. July 14, 1908. Length, 140 mm.

22881. Togian Bay, Togian. March 19, 1909. Length, 141 mm.

20743, 20744. Tonquil Island. September 14, 1909. Length, 67 to 84 mm. (6149. Canines, upper, 2—2; lower, 0—0.)

7689. Ulugan Bay, Palawan Island. December 29, 1908. Length, 202 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 1316. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 214 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 976. Binang Unang Island, Celebes. November 17, 1909. Length, 222 mm. (Canines, upper 1—0; lower, 0—0.)

A. 871. Limbe Strait, Celebes. November 10, 1909. Length, 250 mm. (Canines, upper, 2—1; lower, 0—0.) Teeth dusky rose. Two dusky chin stripes. No mottling on side or pale on tail.

A. 1041. Malibagu Point, Celebes. November 21, 1909. Length, 250 mm.

13655. Sadaa Island, Celebes. March 17, 1909. Length, 185 mm. (Canines, upper, 2—1; lower, 0—0.)

A. 1148 to A. 1150. Gane Road, Gillolo Island, Dutch East Indies. December 1, 1909. Length, 224 to 234 mm. (All with canines, upper, 1—1; lower, 0—0.) Back and side olive, saddled by paler; caudal peduncle pale but without definite blotch; throat and breast with purple shades; dorsal shows obscure base and inframarginal bars.

12165 to 12168, 12170, 12171, 12173 and 12174. Apra Bay, Guam. November 19 to 21, 1907. Length, 76 to 194 mm.

4458. Apra Bay, Guam. November 19, 1921. Length, 238 mm. (Canines, upper, 2—1; lower, 0—0.) [Dr. 5479.]

12935 and 12936, 13336. Tidore Island, south of Ternate. Length, 173 to 203 mm. (12935 and 13336, with canines, upper, 1—1; lower, 0—0; 12936, canines, upper, 2—2; lower, 0—0.)

1397. Tapiantana Island. December 21, 1909. August 5, 1909. [Dr. 5505.]

CALLYODON MARGARITUS (Cartier)

Pseudoscarus margaritus Cartier, Verh. Phys. Med. Ges. Würzburg, vol. 5, 1874, p. 105. Cebu.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 559 (Cebu).

Callyodon albipunctatus Seale, Philippine Journ. Sci., vol. 4 (6), 1909, p. 526. Sitanki Island, Jolo Archipelago.

Callyodon muricatus (not Valenciennes) Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 52 (Zamboanga).

Depth 2⅗ to 2⅔; head 2⅖ to 2⅔, width 2⅕ to 2¼. Snout 2⅕ to 2⅓; eye 6⅛ to 6⅖, 3 in snout, 2⅖ to 2¾ in interorbital; mouth cleft 4 to 4⅙ in head; no canines; interorbital 3 to 3⅛, broadly convex. Gill rakers 18+28, fine, slender, flexible.

Scales in lateral line 17, 4 or 5+3; 2 scales above lateral line, 6 below, 4 predorsal; cheek with 2 rows of scales, preopercle flange naked. Scales with 29 or 30 basal radiating striae, apical 27 to 32; circuli very fine.

D. IX, 10, 1, ninth spine 2⅞ to 3¼, first ray 2⅞ to 3⅙; A. III, 9, 1, third spine 3⅗ to 4, first ray 2⅞ to 3⅛; caudal 1⅗ to 1¾, truncate, convex behind as expanded; least depth of caudal peduncle 2⅕ to 2⅗; pectoral 1⅖ to 1½; ventral 1⅞ to 2⅖.

Brown generally. On body 8 pale spots, each about scale in size, in 2 longitudinal rows. Iris yellowish. Fins all dull brown, vertical ones variably darker terminally.

At present known only from the Philippines, Celebes, and Formosa. Cartier's description, though brief, applies to the present species. The posterior canines are said to be absent. Body with 3 rows of silver-white spots each side and 2 similar spots each side of tail. Vertical fins and ventrals blackish violet. Length, 85 mm. *Callyodon albipunctatus* is surely a synonym.

6276 to 6279. Candaraman Island, Balabac. January 4, 1909. Length, 109 to 150 mm. (6277 [1025]; 6278, canines, upper, 1—2; lower, 0—0.)

7730. Caxisigan Island, near Balabac. January 2, 1909. Length, 196 mm. Teeth rosy; upper lip and chin vermilion; vermilion shades continuing over dusky of lower head; chin color more or less claret; dorsal, anal, and caudal without bars or stripes; ventrals pale; pectoral membranes hyaline, rays reddish brown below.

5325. Cebu market. April 4, 1908. Length, 203 mm. Teeth reddish; lips reddish; chin same; body grayish, with reddish edges or vertical lines on the scales; vertical fins body color; dorsal narrowly dusky in front and at tip; anal same, more diffuse; paired fins with more reddish; iris golden.

8412. Cebu market. March 20, 1909. Length, 256 mm. (Canines, upper, 1—2; lower, 0—0.)

A. 490. Lampinigan Island. September 11, 1909. Length, 222 mm. (Canines, upper, 1—1; lower, 0—0.)

9009. Langao Point, Luzon. June 24, 1909. Length, 220 mm. (Canines, upper, 1—2; lower, 0—0.)

17213. Murcielagos Bay. August 9, 1909. Length, 188 mm. (Canines, upper 2—2; lower, 0—0.)

9274. Same data. Length, 210 mm.

16933 and 16934. Simaluc Island. September 22, 1909. Length, 190 to 210 mm. (16933, canines, upper, 2—2; lower, 0—0; 16934, canines, upper, 2—2; lower, 0—0.) [1982.] General color dark olive to violet black; on side four pairs of light spots, first even with tip of extended pectoral, last on middle of caudal peduncle; teeth rosy; upper lip, chin, and lower head dusky crimson. Dorsal body color, very obscure bar at base and another near margin. Pectorals hyaline in membranes, rays dusky pink.

16270. Teomabal Island. September 18, 1909. Length, 112 mm.

7170. West coast of Palaui Island. November 18, 1908. 2 examples, 174 to 184 mm. Teeth pale rosy. Body colors very much faded, probably olivaceous with pinkish shades on front of head and breast; top of head with bronzy spots; similar spots in center of each scale on upper side and back, sometimes forming bar across scale. Fins apparently without marks, darker marginally, except pectorals, which with reddish brown shades.

11044. Cape Kait, Libani Bay, Celebes, Dutch East Indies. December 29, 1909. Length, 198 mm.

84242 U.S.N.M. Zamboanga. Dr. F. Baker. 2 examples. Length, 185 to 255 mm. As *Callyodon muricatus.*

CALLYODON SORDIDUS (Forskål)

Scarus sordidus Forskål, Descript. Animal., 1775, pp. x, 30. Arabia.

Pseudoscarus sordidus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 568 (types of *Scarus nigricans* and *Scarus mentalis*).—Day, Fishes of India, pt. 3, 1877, p. 413; Fauna British India, vol. 2, 1889, p. 428.—Vinciguerra, Giorn. Romano Scienz. Biol., ser. 2, vol. 19, 1890, p. 487 (Zanzibar).—Steindachner, Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 150 (Kalansiye, Socotra, and Gischin).

Scarus nigricans (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 213. Red Sea.

Scarus mentalis (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 233. Gulf of Accaba.

Scarus variegatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 256. Mauritius.

Pseudoscarus variegatus Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 49 (type).—Sauvage, Hist. Madagascar, Poiss., 1891, p. 472 (type).

Scarus purpureus (not Forskål) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 277. Ulea.

Callyodon purpureus Jordan and Seale, Bull. Bur. Fisher., vol 25, 1905 (1906), p. 316, fig. 57 (Apia, Samoa).

Scarus festivus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 282. Locality unknown?

Scarus chlorodon Jenyns, Voy. Beagle, Fish., 1842, p. 105, pl. 21. Cocos Island, Indian Ocean.

Scarus troscheli Bleeker, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 498. Batavia, Java.

Pseudoscarus troschelii BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 25, pl. 7, fig. 2 (Java).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 237 (copied).—MEYER, An. Soc. Hist. Nat. Madrid, vol. 14, p. 38 (Rubi, New Guinea).—PICAGLIA, Atti Soc. Nat. Modena, ser. 2, vol. 12, 1893, p. 34 (Assab, Red Sea).—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 328 (South Sea).

Pseudoscarus troscheli GÜNTHER, Fishes of Zanzibar, 1865, p. 108, pl. 14, figs. 1–3 (Zanzibar).—BOULENGER, Proc. Zool. Soc. London, 1889, p. 240 (Muscat).—REGAN, Trans. Linn. Soc. London, (2) Zool., vol. 12, 1907, p. 231 (Chagos Archipelago, Peros).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 388 (Gisser, Saleyer, Timor).

Scarus celebicus BLEEKER, Nat. Tijds. Ned. Indie, vol. 7, 1854, p. 253. Macassar.

Pseudoscarus celebicus BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 26, pl. 15, fig. 2 (Celebes).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 237 (China).—KÁROLI, Termesz. Füzetek, Budapest, vol. 5, 1881, p. 175 (Canton).—ELERA, Cat. Fauna Filip., vol. 1, 1895, p. 560 (Luzon, Cavite, Santa Cruz).

Pseudoscarus flavomarginatus KNER, Reise Novara, Fische, vol. 2, 1865, p. 262, pl. 10, fig. 2. Possibly Java.

Pseudoscarus troschelii var. *flavoguttata* STEINDACHNER, Sitzs. Akad. Wiss. Wien, vol. 96 (1), 1887 (1888), p. 63. Gilbert Islands.

Psuedoscarus vitriolinus BRYAN and HERRE, Occas. Pap. Bishop Mus., vol. 4, 1905 (1906), p. 27, fig. 4. Honolulu.

Callyodon pyrrhurus JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 314, fig. 55. Apia and Pago Pago, Samoa.

Callyodon abacurus JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 324, pl. 33. Apia and Pago Pago, Samoa.

Pseudoscarus abacurus GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 329, pl. 162 (Yap, Pelew Islands, Samoa, Gilbert Islands, Tonga, Society Islands, Paumotus).

Callyodon cyanogrammus JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906) p. 330, fig. 63. Apia.

Callyodon rostratus (not GÜNTHER[24]) SEALE, Philippine Journ. Sci., vol. 4 (6), 1909 (November), p. 524. Zamboanga, Mindanao.

Callyodon bowersi SNYDER, Proc. U. S. Nat. Mus., vol. 36, 190, p. 602. Nafa, Okinawa; vol. 42, 1912, p. 509, pl. 66, fig. 3 (type).

Pseudoscarus forsteri (not VALENCIENNES) FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 54 (Zamboanga).

Depth 2½ to 2¾; head 2⅖ to 2⅗, width 2⅛ to 2⅓. Snout 2⅙ to 2⅓; eye 6⅞ to 7⅓, 3 to 3⅓ in snout, 2⅕ to 2¾ in interorbital; mouth cleft 3¾ to 4½ in head; lips cover basal half of teeth; canines absent, often obsolete or imperfect, when sometimes 0 to 2 each side above, rarely 1 or 2 each side below; interorbital 2⅘ to 3$\frac{1}{10}$ in head, convex. Gill rakers 19 or 20+22 to 24, fine, flexible, short.

[24] Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 315, pl. 154. Society Islands. The copy of this work in the library of the Academy of Natural Sciences of Philadelphia bears the stamp of having been received July 19, 1909. It therefore evidently has priority over Seale's reference.

Scales in lateral line 17 or 18+3 to 5+2; 1 or 2 scales above lateral line, 6 below, 3 or 4 predorsal; 2 rows on cheek, none on preopercle flange. Scales with 37 to 44 basal radiating striae, apical 24 to 41; circuli very fine.

D. IX, 10, 1, ninth spine 2⅘ to 3⅓ in head, first ray 2½ to 3⅓; A. III, 9, 1, third spine 3⅕ to 4, first ray 3 to 3½; caudal 1½ to 1¾, truncate or little emarginate, slightly convex as expanded; least depth of caudal peduncle 2¼ to 2¾; pectoral 1⅓ to 1½; ventral 1¾ to 2$\frac{1}{10}$.

Body largely brown, with greenish yellow to olive tinge, scarcely paler below. Edges of lips often narrowly yellowish, and yellowish streak from rictus to eye; two or three short yellow or gray postocular streaks, variously extended though often not greater than extent of an eye diameter. Iris yellowish. Teeth whitish to greenish, usually latter color. Fins brown. Bases of dorsals brownish, especially of rayed fin, and edge narrowly greenish; often soft dorsal medianly, with dark longitudinal band. Anal with grayish base, outer half dull greenish. Caudal brown. Pectoral greenish. Ventral gray white.

East Africa, Red Sea, Mauritius, Madagascar, East Indies, India, China, Melanesia, and Micronesia to the Paumotus. Extremely variable in color, from pale gray or pink to green or dark brown. We have followed the synonymy of Day, accepting *Scarus sordidus* of Forskål as the oldest name. Some of our dark medium-sized examples are even sufficient to approach *Pseudoscarus rhoduropterus* Bleeker, but the five dark broad transverse bands are obscure and ill-defined. Likewise *Scarus gymnognathus* Bleeker is also only slightly different in color, and may really be synonymous. Several of our examples also represent *Callyodon bowersi* as two yellow bands more or less connect the interorbital, though sometimes only one complete. The soft dorsal has a median green longitudinal band and the greenish anal has a gray subbasal longitudinal pale band.

8123 and 8131. Alibijiban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 210 to 270 mm. Both are var. *bowersi* (8123, canines, upper, 1—0; lower, 0—0.) Teeth pale green; general color, viridian; lips dull orange, changing to peach bloom at corners of mouth; dash or two of peach behind lower corner; green band on snout above upper lip, behind purplish, continuing into bright band in front of eye; passes through eye and breaks into two parts behind, lower continuing brokenly to point of opercle; back yellowish green, becoming viridian under dorsal, scales with bright pink bar at base; lower parts blue, with purplish shade; chin bright blue; interopercle with peach overshade; area of dusky yellow in middle of body between caudal peduncle and mid portion of body. Front and margin of dorsal bluish green, nearly equal to diameter of eye, body of fin below orange with purplish shades, green blotches at bases of rays and in middle of membranes, beginning with the posterior spines, last ray green. Caudal bright blue, with few dashes of dull purplish in base of lower part of rays. Anal mainly green, narrow purplish bar at

base, which continued well up on last membrane. Ventrals pale green. Pectorals green, with narrow reddish bar in upper half, about midway on rays. (8131, canines, upper, 1—1; lower, 0—0.) Teeth rosy; snout green, upper lip scarlet at corners; lower lip narrowly scarlet, with broad band of blue on either side, broken through middle, orange scarlet behind; blue spot at end of interopercle; interrupted blue line on throat, showing only in front and at meeting of branchiostegal membranes; dark green band across front of interorbital region, joining another across preorbital, inclosing dark purplish brown more or less rectangular area between interorbital and snout; top of head green, with brown areas on hinder portion of interorbital region; back and posterior of sides green, scales with reddish bar at base; from eye across upper opercle and into side to last third of pectoral bright scarlet orange area; small square or rectangular dash of green behind eye; under eye green, covering cheek and lower opercle; on lower preopercular limb and interopercle dull orange and slaty shades; breast and belly region gray, with orange wash. Front and margin of dorsal blue, base of rays blue, becoming green posteriorly, including all of last half ray; body orange, with narrow central bar of green, beginning on third or fourth spine. Caudal blue, each ray except outer ones with narrow stripe of dull orange brown. Outer half of anal bluish green, including all of anterior rays and narrowing to about two-fifths of penultimate ray; rays bluish at base, dull orange or ocher bar across basal portion, broadest behind. Ventrals pale orange, fronts bright blue. Pectorals orange, upper rays bluish green and basal portion pale green.

8104. Alimango Bay. March 5, 1909. Length, 273 mm. (Canines, upper, 1—1; lower, 0—0.)

6496. Balikias Bay. July 17, 1908. Length, 205 mm. (Canines, upper, 2—2; lower, 1—1.) Teeth white. Tip of snout, front of cheek grass green; lips very narrowly lilac, same at lower head and body; blue stripes and dots on lower head and chin; median blue line on throat; greenish stripe through eye; front of head slaty lavender. Dorsal and anal fronts and edges blue; body of dorsal orange scarlet, base green; anal body purplish; median longitudinal band on dorsal and anal obsolete. Edges of caudal lobes blue, within pale green, somewhat purplish at base. Pectoral nearly indigo, purplish stripe through center. Ventral with front blue, rays pale purplish to orange, body green and geranium.

A. 498. Baluk Baluk Island. September 12, 1909. Length, 248 mm. (Canines, upper, 2—2; lower, 0—0.)

8623, 16356. Biri Channel. June 1, 1909. Length, 230 to 244 mm. (8623, canines, upper, 1—1; lower, 0—0; 16356, canines, upper, 2—2; lower, 0—0; both var. *bowersi*).

9934 and 12121. Biri Channel. June 2, 1909. Length, 187 to 195 mm. (9934, canines, upper, 1—1; lower, 0—0; 12121, canines, upper, 2—2; lower, 0—0; *bowersi*).

8643, 8648, 8651. Biri Channel. June 22, 1909. Length, 177 to 250 mm. (8643, canines, upper, 3—2; lower, 0—0; 8648, canines, upper, 1—1; lower, 0—0; 8651, canines, upper, 1—1; lower, 1—1.)

7455. Bolalo Bay, Palawan. December 21, 1908. Length, 285 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth dusky rose; side of head broadly green; dorsal with blue front and margin, base and central bar green on bright orange body ground; anal blue, with reddish median bar from base of first spine to near tip of last ray; two round spots on last two membranes near base.

5617 and 5618, 5620. Busin Bay, Burias Island. April 22, 1908. Length, 215 to 307 mm. (5617, canines, upper, 2—2; lower, 0—0; 5618 and 5629, canines, upper, 1—1; lower, 0—0.)

5660. Busin Harbor, Burias Island. April 23, 1908. (Canines, upper, 1—1; lower, 0—0.)

19038. Cagayan, Sulu Island. January 8, 1909. Length, 200 mm. (Canines, upper, 1—2; lower, 0—0 [1073].) Teeth green; upper lip lavender; green stripe behind, running backward under eye; front of head lilac; green arch connecting two eyes, passing through upper part of eye somewhat posteriorly; blue stripes on belly; dorsal front and margin broadly blue, body purplish orange, base greenish; ventrals similar, but more pronounced blue.

8374. Calangaman Island. March 11, 1909. Length, 217 mm. (Canines, upper, 3—3; lower, 0—0.)

7770 and 7774. Candaraman Island. January 4, 1909. Length, 192 to 245 mm. (Canines, upper, 1—1; lower, 0—0.) (7770.) Teeth grayish; lips scarlet; green stripe from corner of lower lip under corner of mouth connecting with stripe across nose, continued backward under eye to opercle; another green bar above eye extending less than diameter of eye backward, connecting with its fellow in curve across interorbital; short dash of green behind middle of eye; cheek reddish; body reddish through upper portion, greenish shades predominating below and on caudal peduncle. Front and margin of dorsal greenish; shades of green at bases of spines and rays; body of fin orange, with obscure row of green blotches through center. Caudal green. Anal with terminal two-thirds bluish green, orange at base extending into last ray. Ventrals pale. Pectorals yellowish green, probably with an orange brown (?) stripe through upper portion. (7774.) Teeth slightly dusky; cheek and opercle yellowish green, with bright green limiting border.

8022. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 237 mm. (Canines, upper, 2—2; lower, 0—0.) Teeth green or indigo; lips orange, band from nose backward under eye of bright green; another band through upper eye of green, obscurely meeting its fellow in front over nostrils; third short stripe behind eye; chin greenish, with orange spot below corner of mouth; lower head yellowish, color continued on breast and belly; general colors green, darker above, with more or less yellowish posteriorly and broad purplish margins to all scales. Dorsal with broad green or blue front and margin, green at base, body orange, with partial central green bar originating in fourth membranes and somewhat broken anteriorly. Caudal bluish green with an obscure orange stripe on each lobe. Anal green on outside three-fifths or two-thirds, base very narrowly blue, including last half ray, with an orange bar outside. Ventrals with pale blue front, otherwise yellowish. Pectorals green, orange stripe in upper half.

7725 and 7726. Caxisigan Island, near Balabac. January 2, 1909. Length, 218 to 245 mm. (7725, canines, upper, 1—1; lower, 0—0; 7726, canines, upper, 2—2; lower, 0—0.) General color green, becoming dusky on back and yellow on side under dorsal axil; pale lilac shades below; lips pink; bright green band behind upper lip, joining one crossing chin and rounding backward under eye to point of opercle; above across nose slaty purple, continued into eye and behind and beneath eye with short dash behind middle of eye; chin bluish, with blue median throat lines; lower head with pinkish shades, most marked just behind green of chin; belly with obscure stripes of lilac pink. Dorsal green, front and anterior margin bluish; broad bar of geranium, through center. Caudal bluish, with pinkish spots at base; about six of these around central one; dashes of same color on base of rays. Anal similar to dorsal but central bar placed at base in front and ending on last membranes. Ventrals pale bluish green. Pectorals bright green, with narrow pink bar half through upper part. Teeth bluish.

5318. Cebu market. April 4, 1908. Length, 242 mm. (Canines, upper, 1—1; lower, 0—0.) General color greenish, centers of scales on side and back brownish or claret; lips pink; bright green stripe on nose running backward under eye; lavender stripe above behind eye; top of head in front of eyes green, same behind eyes, with small blotch of paler; chin broadly blue, continuing backward mesially; lower head pale greenish, cheek lighter; body yellowish under posterior dorsal. Dorsal front and edge blue, base and last rays same, centrally reddish with median blue bar. Front and two-thirds of anal distally blue, lavender toward base. Caudal china-blue with dashes of lavender near base. Ventral bluish. Pectoral blue, with narrow purple half-stripe. Blue on belly in two stripes on each side and a median line. Teeth green, edged with pink basally. Iris golden.

8406. Cebu market. March 19, 1909. Length, 230 mm. (Canines, upper, 1—1; lower 0—0; var. *bowersi*.)

8156. Cebu market. August 29, 1909. Length, 228 mm. (Canines, upper, 1—1; lower 0—0; var. *bowersi*).

7571. Endeavor Strait. December 23, 1908. Length, 320 mm. (Canines, upper, 1—1; lower, 0—0.)

6224 and 6226. Galera Bay. June 9, 1908. Length, 233 to 240 mm. (6224, canines, upper, 2—2; lower 0—0.) Teeth pale green. Lips orange; bright green bands across snout and lower mouth corner; blue spot in chin; throat blue. General body color ochraceous with umber wash, blue green below with broad geranium red bases to scales; greenish stripes in centers of scales in abdominal region. (6226, canines, upper 0—1; lower, 0—0.) Cheek yellowish green. Teeth very pale pink. Purplish and blue on lower head, bright green above with umber shades on anterior back.

6247. Same data. Length, 237 mm. (Canines, upper, 1—1; lower, 0—0; var. *bowersi*.) Teeth pink. Area above pectoral orange. Cheek and head above green, also back and body posteriorly, scales of latter with geranium basal bar.

6353. Jamelo Bay. July 13, 1908. Length, 300 mm. Teeth dusky white. Scales of back olive and green with bar of reddish to geranium at base; from middle of side becoming pale. Head dusky pink. Sulphur yellow on side medially under pectoral. Caudal peduncle pink. Lips peach red, green band above upper passes backward below eye obscurely to point of opercle; short green stripe through eye above. Chin and throat band bright blue; blue stripe to mouth corner. Dorsal blue, with broad orange median band. Edges of caudal lobes and fork blue, orange bands and stripes. Pectoral purplish, upper ray blue, dusky hyaline terminally below. Ventral salmon, with pale blue fronts.

4863. Jolo market. February 13, 1909. Length, 218 mm. (Canines upper, 2—2; lower, 1—0.)

5164. Jolo market. March 6, 1908. Length, 190 mm.

13040. Kayoa Island. November 29, 1909. Length, 198 mm. (Canines, upper, 2—2; lower, 0—0.)

A. 1337. Labuan Blanda Island. December 14, 1909. Length, 248 mm. (Canines, upper, 1—1; lower, 0—0.)

8998. Langao Port, Luzon. June 24, 1909. (Canines, upper, 1—1; lower, 0—0; var. *bowersi*.)

5955. Little Santa Cruz Island. May 26, 1908. Length, 228 mm.

6069 to 6072. Little Santa Cruz Island. May 28, 1908. Length, 225 to 239 mm. (6069, canines, upper, 1—1; lower, 0—0; 6072, canines, upper, 2—2; lower 0—0.)

A. 1079 and A. 1089. Maitara Island. November 26, 1909. Length, 225 to 230 mm. (A. 1079, canines, upper, 2—2; lower 0—0.)

9272. Murcielagos Bay. August 9, 1909. Length, 270 mm. (Canines, upper, 1—2; lower, 0—0.)

5911. Parang, Mindanao. May 23, 1908. Length, 227 mm. Teeth, blue. Side of body above olive yellow to cadmium, more or less soiled dusky; back anteriorly dusky yellowish green, becoming viridian on front interorbital. Lilac stripe below eye covering most of preorbital, meeting opposite one on snout. Cheek greenish buff, separated from lilac stripe by green stripe dividing behind mouth corner, one branch passing across nose, other branch below mouth corner and across chin. Lips pink, except corner of lower invaded by green. Breast green. Lower head purplish blue. Throat bluish. Abdominal region and above ventral pink, more or less obscurely striped and washed blue. Front and edge of dorsal green, body with blue shades, base green and includes last ray. Caudal indigo, dashed with pinkish basally. Anal green terminally, bluish pink basally, front and tips of rays blue, and blue separating green from pink, base and last half ray blue. Ventrals very pale greenish, fronts more distinctly green. Pectorals green, dash of red in center of upper part, lower membranes hyaline terminally. Iris silvery.

5884. Polloc. May 22, 1908. Length, 223 mm. (Canines, upper, 1—1; lower, 0—0.) Edges of teeth slightly greenish, base reddish; lips narrowly pale orange; snout and chin barred with green or blue. Cheeks greenish yellow, broadly margined with green.

7994. Port Banalacan, Marinduque Island. February 23, 1909. Length, 288 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth pale greenish; top of head emerald, more or less reddish blotches above eye; both lips broadly blue, very narrowly margined toward corner of mouth with lavender purple; scales of back and side dark green with broad magenta bases; more or less of an orange wash on anterior back to terminal third of pectoral; magenta stripe from above corner of mouth to eye, passing under and backward above green of cheek and opercle; another branch from behind middle of eye upward to shoulder. Front and margin of dorsal and anal blue, base green; body of dorsal purplish orange with narrow green bar through center originating behind third spine; magenta bar through center of anal; caudal very dark green with narrow magenta bar from each lobe; ventral fronts blue, remainder of fin with slight purplish shade and occasional streak of blue; pectoral green with narrow stripe of purplish in upper half reaching neither base nor tip.

7277. Port Matalvi. November 23, 1908. Length, 245 mm. (Canines, upper, 2—0; lower, 0—0.) Teeth pale green or indigo. General color green, becoming lemon on side under soft dorsal. Lower surfaces with blue lilac shades. Upper lip lilac, same except at corners, from which green stripe forms similar stripe across snout, both joining and passing backward under eye. Snout behind latter stripe smoky purplish fading to lilac, short bar of same under eye and dash behind eye. Throat line blue. Dorsal green, becoming dark indigo at extreme margin and front; irregular bar of purplish and orange shades through body of fin, somewhat below center, with few green posterior spots. Caudal bright blue, darker to purplish basally and green in center of rays. Anal base lilac, forms narrow bar wide on pupil scarcely reaching first spine, rest of fin with last ray green. Ventral pale green. Pectoral bright green, with only light trace of purple in upper half.

7400, 7403, 7404. Port Uson, west of Pinas Island. December 17, 1908. Length, 220 to 230 mm. (All have canines, upper, 1—1; lower, 0—0; 7400 var. *bowersi*.) (7400.) Teeth pale rosy. Side of head green with reddish median shades. Large orange area above pectoral. Lips narrowly geranium, bright blue bands posterior. (7403 and 7404.) Teeth pale greenish at edge, rosy at base. Ground colors brilliant viridescent green. Lips reddish, with blue semicircum oral bars.

4971 and 4972. Ragay River, fresh-water. Length, 218 to 240 mm. (4971, canines, upper, 2—2; lower, 0—0.) Scales dull green with vertical pinkish-red bars across each; top of head reddish brown; grass green lines through eye and purplish bar through lower part of eye to snout; cheek peach red, divided from upper part of head by wavy bright green line, becoming beryl as it crosses snout; upper lip pinkish; lower lip same, with blue mottlings across to angle of mouth and chin. Teeth very pale green. Dorsal dull orange through middle, green at base; front and edge broadly dusky blue, which extends down vertical margin. Caudal pale indigo, with dashes of purple and green on central rays. Distal half and front of anal bluish green, base peach pink, and blue on last ray. Ventral pale green, edge blue. Pectoral pale green, with short stripe of peach red in upper half. (4972, canines, upper, 1—2; lower, 0—0.) Green teeth; upper and lower lips pale geranium red, bluish green around corners of mouth and across snout above, running back under eye; chin greenish blue.

7297, 7298, 7320, 7326. Sablayan, Mindoro. December 12, 1908. Length, 230 to 262 mm. (7297, canines, upper, 1—1; lower, 0—0; var. *bowersi*; 7298, canines, upper, 1—0; lower 0—0; 7320, canines, upper, 1—1; lower 0—0; 7326, canines, upper, 1—1; lower, 0—0.)

5576. San Miguel. April 21, 1908. Length, 222 mm. (Canines, upper, 0—1; lower, 0—0.) Teeth white on edge, orange at base; lower lip bright blue, upper same, becoming orange at corner; lower head heliotrope; cheek greenish yellow, bordered with emerald, shading into darker green against other color; top of head hooker green; stripe of same through upper eye; pale geranium stripe across preorbital to corner of mouth; dash of blue behind chin and line along throat area above base of pectoral with an orange greenish cast; posterior portion of body light hooker green, bases of scales with vertical geranium red bar; lower parts shading into lilac. Base of dorsal same, front and margin blue, body of fin orange; green on and under scales at base, and pale green bar through center; last ray green. Caudal with green edges and center, bluish at tips, with a purple stripe through each lobe ending in orange. Anal front and margin blue, center heliotrope, base and last ray green. Ventral yellowish, more or less lavender below. Pectoral Antwerp blue, upper half with dull Chinese orange stripe, greenish and hyaline below; base pale. Iris golden.

5589. San Miguel. April 21, 1908. Length, 234 mm. (Canines, upper, 1—1; lower, 0—0.) Cheeks yellowish green. Lips green or blue. Teeth pale.

5681. Santa Cruz. April 24, 1908. Top of head along base of dorsal and body above and scales emerald; area behind shoulder pinkish orange; bars on posterior scales geranium; teeth pale green at edge, slightly rosy at base; lips blue, corners slightly edged with orange lavender; round spot of same in middle of lower lip; lower head and breast with lilac shades; throat line blue; dash of same color on front of interopercle; band behind upper lip and area above eye somewhat purplish; preorbital stripe purple, turning under eye back to opercle suffusing postorbital; cheek buff green, edged with emerald and dark green.

A. 621 and A. 617. Simaluc Island. September 22, 1909. Length, 240 to 252 mm. (A. 621, canines, upper, 3—3; lower, 0—0.) (A. 617, canines, upper, 1—1; lower, 0—0, var. *pyrrhurus*.) Teeth dusky rose, upper lip and lower head with little crimson. Caudal pale crimson, no evidence of dark blotch. Dorsal with obscure basal and inframarginal reddish bar. Pectorals pale purplish at base and on upper three or four rays, latter blackish at tip, terminal portion of remaining fin yellow.

A. 550. Sulade Island. September 17, 1909. Length, 262 mm. (Canines, upper, 2—0; lower, 0—0.)

21903. Tapiantana Island. September 13, 1909. Length, 203 mm. (Canines, upper, 1—2; lower, 0—0.)

12493. Tara Island. December 14, 1909. Length, 177 mm. (Canines, upper, 2—2; lower, 0—0.)

7704. Ulugan Bay, Palawan Island. December 29, 1908. Length, 230 mm. (Canines, upper, 1—1; lower, 0—0.) Teeth dusky rose; lips narrowly pink; green band above eye; red from corner of mouth extending across preorbital through eye, dividing into one stripe below eye and near band, merging into orange of upper preopercle; front of head pink over green, posteriorly green band; interorbital region with green diamond-shaped area, points touching either eye where continued as superocular stripe; cheek and middle of opercle pale yellowish green, becoming bright green around edges. Front, margin and base of dorsal blue, body orange, with blue green band through center, broken posteriorly. Caudal blue, with stripes of purple and orange. Anal blue, greenish at base, with median bar of purplish. Ventrals with blue fronts. Pectoral reddish orange, upper ray blue, base pale green.

7660 and 7671. Ulugan Bay. December 28, 1908. Length, 233 to 295 mm. (Both with canines, upper, 1—1; lower, 0—0.)

7713. Ulugan Bay, Oyster Inlet. December 29, 1909. Length, 285 mm. (Canines, upper, 1—4; lower, 0—0.)

7153 and 7154. West coast of Palaui Island. November 18, 1908. Length, 280 to 288 mm. (Both have canines, upper, 1—1; lower, 0—0, var. *bowersi*.) (7153.) General color bright green, scales on posterior half of body with magenta basal bar. Lower surface with lilac overshades merging into magenta. Teeth pale rosy. Snout tip blue green; upper lip corners and entire lower lip narrowly red. Chin blue, with blue throat line. Lower cheek pale orange, merging into lilac shades below, more red anteriorly. Red bar and central circular spot in blue of chin; blue of posterior connected below and above with clear portion; area of dark smoky purple before eyes, reaches almost to snout. Interorbital and forehead crossed or spotted with dark orange or lilac markings. Brilliant scarlet area extends below upper level of eye from slightly behind eye to last third of pectoral, thence downward to lower level of pectoral, base roughly triangular. Green on snout extends backward across cheek and opercle as broad stripe involving entire pectoral base. Front and margin of dorsal bright blue; blue bar at base, central portion of fin orange with broken blue bar and several roundish spots. Caudal blue, with purplish orange stripes through center of rays. Anal blue terminally, including entire first spine, thence narrowing to tip of last ray; base blue, somewhat oblique lilac bar from base of second spine to tip of last ray. Pectoral with first and second rays green, rest of fin except base, orange; below and terminally hyaline. Ventral blue in front and on last half of rays, central portion of fin lilac with orange shades. (7154.) Same as above except green on cheek and opercle much more extensive and head less elaborately marked. No blue spots on center of dorsal.

A. 793. Binang Unang Island, Celebes. November 17, 1909. Length, 973 mm. (Canines, upper, 1—2; lower, 0—0.)

A. 1447. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 260 mm. (A. 1447, canines, upper, 2—2; lower, 0—0.) General color green, top of head with lavender shades; teeth dusky rose; lips peach bloom and chin behind blue band; about base of pectoral and behind and above tip of fin with yellow shades, green colors constant otherwise posteriorly; pink bar at base of each scale. Dorsal front margin and base bright blue, body orange, last ray, greenish. Front margin, base and last ray of anal brighter blue than dorsal, body pink. Caudal greenish blue, each lobe with purplish stripe which becomes orange at extreme tip; fin with white and dusky line between stripes

at its tip. Upper rays of pectoral blue, dash of same color through middle of fin at middle of each membrane, fin otherwise broadly purple except at base where greenish sulphur, this color running into last four rays. Ventrals with blue fronts, rays otherwise pink. (A. 1448.) Teeth pale blue. Side very broadly washed with yellowish, few yellow and white spots (probably of parasitic origin) on side and belly. Dorsal green, central bar of orange rising at base of second spine extends through base and middle portion to tip of penultimate ray; posterior portion of median band with green bar through center. Anal broadly green, narrow pink bar through base extends distally on last two or three membranes. Caudal bright blue, except olivaceous dash through each lobe. Pectoral nearly green, dash of pink in upper half.

62950 U.S.N.M. Nafa, Okinawa. *Albatross* collection. Type of *Callyodon bowersi.*

51754 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. Type of *Callyodon abacurus.*

51756 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Type of *Callyodon cyanogrammus.*

84254 U.S.N.M. Zamboanga. Dr. F. Baker. 1 example. Length, 232 mm. As *Pseudoscarus forsteri.*

84264 U.S.N.M. Zamboanga. Dr. F. Baker. 1 example. Length, 206 mm. As *Pseudoscarus forsteri.*

51748 U.S.N.M. Samoa. Bureau of Fisheries. Type of *Callyodon pyrrhurus*

CALLYODON QUOYI (Valenciennes)

Scarus quoyi Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 273. Carteret Harbor, New Ireland.

Pseudoscarus quoyi Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 29, pl. 6, fig. 3 (Ternate).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 319 (New Ireland, Ternate, Ponape, Ruk).

Callyodon quoyi Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 96 (Bacon).

Callyodon ogos Seale, Philippine Journ. Sci., vol. 4 (6), 1909, p. 527. Puerta Princesa, Palawan.

Depth 2½ to 2¾; head 2⅔ to 2¾, width 2⅔ to 2½. Snout 2⅛ to 2⅕; eye 7¼ to 8½, 3⅓ to 4 in snout, 2¼ to 2¾ in interorbital; mouth cleft 4 in head; lips half cover teeth; canines rather large and strong, usually 1 or 2 above each side, seldom any below; interorbital 3 to 3¼, convex. Gill rakers 22+24, flexible, short.

Scales in lateral line 17 or 18+5 or 6+2; 2 scales above lateral line, 6 or 7 below, 3 or 4 predorsal; cheek with 2 rows of scales, none on preopercle flange. Scales with 31 to 43 basal radiating striae; apical 43 to 47, imperfect; circuli fine.

D. IX, 10, 1, ninth spine 2⅗ to 2⅔ in head, first ray 2⅗ to 3: A. III, 9, 1, third spine 3¼ to 3⅗, first ray 2⅞; caudal 1¼ to 1⅖, emarginate, truncate as expanded; least depth of caudal peduncle 2¼ to 2⅓; pectoral 1¼ to 1⅓; ventral 1⅔ to 1¾.

Uniformly brown generally. Edges of lips narrowly greenish; greenish line from rictus up to eye and then toward pectoral origin, also lower line slightly oblique down to lower base of pectoral, inclosing greenish area. Also another pale line transversely across chin.

From upper hind eye edge oblique greenish narrow loup toward suprascapula. Dorsals pale grayish brown, margin narrowly brownish and median dark longitudinal band. Anals pale greenish gray, with median whitish longitudinal band. Caudal brown, with grayish longitudinal streak on upper and another on median lower caudal rays. Pectoral brown, with median upper rays gray to deep brown. Ventral brown.

East Indies, Philippines, Melanesia, Micronesia.

8124, 8125, 8157. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length 228 to 243 mm. (8124, canines, upper, 2—1; lower, 0—0; 8125, canines, upper, 1—1; lower, 0–0; 8157, canines, upper, 1—2; lower, 0—0.) Teeth pale greenish; lips blue with borders very narrowly pink; middle of top of head emerald green; subocular region and snout above blue of lip with purplish shade; bright green bar through upper eye and dash behind lower portion; blue of lower lip merges backward from corner of mouth into green border about rectangular pale buff area, covering cheek and lower opercular region; anterior back, except median portion, which is emerald green along base of dorsal, more or less drab, behind back and sides viridian with broad magenta bar at base of each scale; lower head and belly with lilac shades, continued along base of anal and base of caudal. Front and margin of dorsal and anal blue; body of dorsal from orange to dull geranium, latter color below; median bar of green and four colors of about equal breadth; base of entire fin greenish, including last ray. Caudal bright green, narrow purplish lavender stripe through each lobe. Base of anal broadly green, median stripe of magenta or purplish. Front of ventrals blue, with greenish shades on hinder portion; middle three rays very pale purple, last bluish. Pectoral bluish green, well-defined purplish stripe through upper half.

5621. Busin Harbor, Burias Island. April 22, 1908. Length, 297 mm. (Canines; upper, 1—1; lower, 0—0.) Back and side bright grass green, each scale with vertical bar of mauve, which color covers region above anal base; belly, breast, base of caudal peduncle royal purple; region between pectoral, eye, and dorsal base bright cinnamon rufous; very light green area from corner of mouth backward to edge of opercle and to pectoral base, color extending to lower edge of eye and obliquely but straight backward below; same area margined with greenish blue; lower part of head lilac, bluish median line; top of head and snout parrot green, large purple blotch over eye, before and behind; broad mauve or phlox band from lower eye to corner of mouth; upper lip score's blue, with cobalt blue posterior margin; lower lip score's blue and lateral blotch of same color on either side of median line behind tip, but not meeting below. Iris dark blue externally, then yellow, then hazel. Dorsal with broad caerulean blue marginal band extending to base of first ray, below wider coral red band, then broad grass green band from second to penultimate membrane and finally broad rose pink band along base becoming coral red anteriorly and joining second band; posteriorly green of back extends on dorsal base, includes all of last ray and most of last membrane. Caudal viridian green, lighter basally, hind margin caerulean blue, also edges of lobes; broad royal purple bars extend into fin from base and nearly reach hind edge near upper and lower edges. Anal emerald or light viridian green at basal half, broad marginal zone of score's blue with narrow geranium stripe between, blue and geranium extending to base of first membrane. Ventral with front edge broadly bright glaucous, rest faintly rose purple and lilac. Pectoral bright greenish blue, membranes hyaline; large elongated submarginal rose pink spot, involving third ray and membrane; base light rice green. Lower jaw, chin, and throat like upper lip.

5537. Cataingan Bay. April 18, 1908. Length, 187 mm. (Canines, upper, 0—1; lower, 0—0.) Teeth white rosy at base; back emerald, with heliotrope vertical bars on scales; lower head and body heliotrope to lavender; lips bright blue; cheek with dusky yellowish area bordered by green.

8024. Capulaan Bay, Pagbilao Island. February 24, 1909. Length 202 mm. (Canines, upper, 1—1; lower, 0—0.) Yellowish green cheek, distinctly colored or clear, including base of pectoral; anterior body—that is, shoulder region—more or less orange.

5967. Little Santa Cruz Island. May 26, 1908. Length, 282 mm. (Canines, upper, 1—1; lower, 0—0.) Cheek yellowish green. Teeth dusky white. Lips narrowly orange, blue stripes posterior.

6075. Little Santa Cruz Island, Zamboanga. May 28, 1908. Length 300 mm. (Canines, upper, 1—2; lower, 0—0.) Greenish yellow on cheek. Teeth almost white. Lips blue, upper with pale pink margin.

6144. Mansalay. June 4, 1908. Length, 310 mm. (Canines, upper, 1—1; lower, 0—0.) Cheek yellowish green.

5557. Masbate Reef, Masbate Island. April 20, 1908. Length, 300 mm. (Canines, upper, 2—1; lower, 0—0.) Cheeks yellowish green. Lower surface lavender. Teeth with greenish edges, bases rosy.

6225. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length 247 mm. (Canines, upper, 1—1; lower, 0—0.)

5432, 5433, 5435. Off Bohol. April 8, 1908. Length, 313 to 323 mm. (5432, canines, upper, 0—1; lower, 0—0; 5433, canines, upper, 1—0; lower 0—0.) Teeth pale greenish. Light blue, upper reddish at corner. Lower head and breast lavender. Cheeks yellowish green, blotch crossing opercle bordered by bright green. General body color green and red.

4874. Pangasinan Island. February 13, 1908. Length, 270 mm. (Canines, upper 1—1; lower, 0—0.) General color emerald green, bases of scales with vertical light red bars; back under front of dorsal somewhat lighter. Rhomboidal area of pale across cheek and lower part of opercle, bordered by green line about breadth of pupil which continued along lower lip from corner of mouth, expanding on median part of chin and prolonged backward on sublingual region to edge of branchiostegal membrane. Another spatulate line from lower corner of rhomboidal area obliquely downward, not quite meeting other blue of chin. Line of similar color through upper part of eye, and another along upper lip. Top of head of about same color as markings. Dorsal fin blue green, with two orange brown bars across entire breadth, two joining at either end around central green bar. Caudal bright blue green, with narrow orange brown stripe on each lobe. Ventral similar to dorsal but with single narrow orange brown bar. Ventral green on edges, pale central area probably light reddish. Pectoral green, with pale red or pink stripe through upper half; base pale, somewhat continuation of pale area on side of head, with greenish bar beneath. Teeth very pale green near margin, reddish near lips.

5909. Parang. May 23, 1908. Length, 298 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth greenish. Cheek yellowish green. Lips very narrowly orange washed with green.

5890. Polloc. May 22, 1908. Length, 245 mm. (Canines, upper, 1—1; lower, 0—0.)

12055. Port Banalacan, Marinduque Island. February 23, 1909. Length, 194 mm. (Canines, upper, 1—1; lower, 0—0.)

8385. Port Dupon, Leyte Island. May 17, 1909. Length, 250 mm. (Canines, upper, 2—1; lower, 0—0.)

6526. Port Maricaban. July 21, 1908. Length, 326 mm.

5795 and 5796. Pujada Bay. May 15, 1908. Length, 287 to 297 mm. (5795, canines, upper, 1—1; lower, 0—0; 5796, canines, upper, 1—2; lower, 0—0.) Cheeks yellowish green.

5280. Romblon. March 25, 1908. Length, 300 mm. (Canines, upper, 1—1; lower, 0—0. Posteriorly scales bright emerald, basal portion heliotrope purple, purplish obscuring green and both becoming dull anteriorly; top of head grass green; purplish above eye and through lower part of eye to corner of mouth; bright green through upper portion of eye; dash of green behind eye; lips very narrowly pale purplish, behind bright blue broadly equal to pupil, continuing from chin on median line of throat; cheek from corner of mouth to edge of opercle pale green; lower head purplish; dash of blue behind chin band; breast and belly purplish, also along anal. Dorsal front and margin broadly blue, scaled base bright green, showing on membranes above; remainder of fin occupied by four bands of equal breadth, marginal blue, then dull salmon, bright green, and reddish salmon; last ray green. Top of caudal peduncle green. Caudal bluish green, scaled base purplish; dashes of the same color continued outwardly and one stripe through each lobe to tip of fin. Anal blue terminally, green basally, and with narrow central bar of heliotrope. Ventral dull purplish, front blue. Pectoral bluish green, with purple area in upper half. Teeth greenish pinkish at base. Iris golden.

5707 and 5708. Surigao, Mindanao. May 8, 1908. Length, 273 to 277 mm. (5707, canines, upper, 1—1; lower, 0—0; 5708. canines, upper, 2—1; lower, 0—0.)

CALLYODON FORSTERI (Valenciennes)

Scarus forsteri VALENCIENNES, Hist. Nat. Poiss., vol. 14, 1839, p. 275. Tahiti.

Pseudoscarus forsteri GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 318, pl. 145 (type).

Callyodon forsteri SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 509 (Okinawa).

Scarus capistratoides BLEEKER, Verh. Batav. Genoot. (Labroied.), vol. 22, 1849, p. 50. Batavia.

Pseudoscarus capistratoides BLEEKER, Atlas Ichth. Ind. Neerl., vol. 1, 1862, p. 29, pl. 6, fig. 2 (Java).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 239 (Java).

Callyodon capistratoides JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 268 (Cagayancillo).

Pseudoscarus labiosus MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, 1882, p. 591. New Guinea.

Scarus gilberti JENKINS, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 59, fig. 17. Honolulu.

Scarus jenkinsi JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 195. Honolulu.

Callyodon bataviensis (not BLEEKER) JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 323, fig. 61 (Apia).

Callyodon oktodon (not BLEEKER) EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 96 (Zamboanga).

Callyodon balinensis (not BLEEKER) EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, 1906, p. 96 (Bacon).

Scarus bataviensis (not BLEEKER) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, No. 7, 1911, p. 305 (Jaluit).

Callyodon pronus (not FOWLER) FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 52 (Cebu).

Depth 2½ to 2¾; head 2⅗ to 3, width 2$\frac{1}{10}$ to 2⅕. Snout 2⅛ to 2⅗; eye 6⅕ to 8⅔, 2½ to 2⅗ in snout, 2¼ to 3 in interorbital; mouth cleft 4 to 5⅙ in head; lips cover ½ to ¾ of teeth; canines large, 1 or 2 above each side and 1 or none each side below, often lower depressed below upper; interorbital 2⅖ to 3⅓ in head, convex. Gill rakers 15 to 25+30, short, fine, flexible.

Scales in lateral line 17 or 18+4 or 5+2 or 3; 2 scales above lateral line, 6 or 7 below, 4 predorsal; cheek with 2 rows of scales, preopercle flange scaleless. Scales with 28 to 43 basal radiating striae, apical 31 to 48; circuli fine.

D. IX, 10, 1, ninth spine 2⅞ to 3¾ in head, first ray 2½ to 3½; A. III, 9, 1, third spine 3⅗ to 5, first ray 2⅘ to 3¾; caudal 1⅛ to 1⅞, emarginate, tips sometimes well exserted, double concave as expanded; least depth of caudal peduncle 2⅕ to 2⅔; pectoral 1⅓ to 1½; ventral 1⅗ to 2.

Brown generally, often each scale slightly paler basally. Yellowish, greenish, or grayish line across each lip and another from their unison to lower eye edge, and continued slightly behind same. Gray or greenish band from nostrils to eye, and sometimes one or two short bands backward from hind eye edge. Iris dull brown. Dorsals dull brown, with longitudinal marginal darker band and one along bases of fin. Some examples with median brown longitudinal band. Anals pale, with broad olivaceous marginal band and narrow basal one. Caudal largely dull olivaceous, with median pale area of four large grayish blotches. Pectoral dark brown, also ventral. Some examples with small gray spot at pectoral axil.

East Indies, Riu Kiu, and Oceania to Hawaii and Tahiti. When faded in alcohol the neutral blotch at the pectoral origin, in combination with the other characters, will usually serve to distinguish this species.

7461. Bolalo Bay. December 21, 1909. Length, 210 mm. (Canines, upper, 0–2; lower, 1–1.)

5674 and 10599. Cabugan Island, Hinunangan Bay, Leyte Island. July 30, 1909. Length, 226 to 230 mm. (5674, canines, upper, 1—1; lower, 1—1 [1767]; 10599, canines, upper, 1—1; lower, 2—2 [1768]. Prevailing colors beryl green, middle of side largely overshaded with purplish and olive; blue median ventral line and blue shaded line through first two rows of scales above ventral contour; teeth white; lips blue, line passing from corner of mouth backward under eye and obscurely washed across opercle to its point; two dashes of green behind eye above this; margins of verticals, as usual, blue; base of dorsal and anal same; purplish band through center of each, showing somewhat orange under marginal blue of dorsal, shading into hyaline pink posteriorly; obscure greenish shade through center; ventrals blue, with purplish-pink stripe through middle; pectoral rays blue, membranes hyaline; caudal has blue tip in fork and irregular blue bar toward base.

9138. Same data. Length, 290 mm. (Canines, upper, 2—1; lower 2—1.) Teeth white; lips blue, becoming green at corner of mouth, stripe passing across preorbital under eye, pinkish on preopercle; dash of blue on snout in

lavender field; interocular band across interorbital; nape gray and heliotrope purple; scales of back with broad green vertical bar, base and margin heliotrope purple; below level of point of opercle purple, shades fading except on caudal peduncle, and side assumes pale greenish hue, changing to blue on breast with pink wash posteriorly; chin pink, with broad blue, green ended band behind. Front and margin of dorsal and anal and edge of caudal lobes bright blue; body of dorsal orange with green at bases of membranes, coloring spines and few anterior rays somewhat at base. Caudal purplish, with network of green and blue terminally on outer half; tip in fork dusky orange. Anal body lavender green at base. Ventrals pale bluish green. Pectorals purplish, hyaline below, broad blue bar at base and stripe on upper two rays. Dash of green on opercle and front of pectoral inframarginal.

A. 1338. Labuan Blanda Island. December 14, 1909. Length, 222 mm. (Canines, upper, 1—1; lower, 1—1.)

6073. Little Santa Cruz Island, Zamboanga. May 28, 1908. Length, 251 mm. (Canines, upper, 2—2; lower, 2—2.) Teeth white. Lips bright blue, upper continued across preorbital and under eye. Lower head tinged blue on median line across throat, breast, and abdomen. General color much faded, probably geranium and blue, with overshades of yellow. Vertical fins margined blue. Dorsal, ventral, and anal blue basally, body of fins reddish.

5993. Same locality. May 26, 1908. Length, 273 mm. (Canines, upper, 2—1; lower, 1—1.) Viridian, bases of scales pale geranium red. Interorbital bluish; slight orange wash on front of chin; lips blue; line extends back under eye, above on snout and preorbital, somewhat orange continued through eye, extended as double stripe behind over postorbital; orange chin band; front of cheek with bluish band downward to throat and then back across chest to ventral out to lower edge of caudal, orange either side of junctions and very obscure along ventral and anal bases, lower edge of interopercle, branchiostegal membrane and pectoral rays; above bluish green; lower cheek and opercle with more orange areas. Teeth reddish. Dorsal fins with margin and base blue, body obscure orange centrally barred with green, rest very blue. Edge and tip of caudal blue, body purplish brown, marked with blue basally. Anal front, margin, and last ray blue, body orange with blue shades central. Ventral blue striped with orange. Pectoral blue with obscure double stripe and tip of orange. Iris golden.

6531 and 6532. Maricaban Island Reef. July 21, 1908. Length, 250 to 260 mm. (6531, canines, upper, 2—1; lower, 1—1; 6532, canines, upper, 2—1; lower, 1—1.) Teeth white; tip of nose bright blue, including lip and passing backward under eye; lower lip blue, drab behind; blue behind again, continued as throat and median ventral line; greenish blotch on interopercle; greenish on upper and front of cheek; top of head with lilac shades in front, merging into olive behind; general body viridian, with geranium bars at bases of scales. Front and margin of dorsal and anal blue; blue at base, body of fin with dusky orange shades, almost obliterated by greenish central bar. Body of anal reddish. Edges of caudal lobes blue, tip within fork blue, body with orange shades; blue at base and crossed by a bar of four round blue spots; lobes with purplish central stripe. Ventral blue, with orange stripe through middle. Pectoral blue, with obscure stripe in upper portion of broken orange shades.

9357. Murcielagos Bay. August 21, 1909. Length, 249 mm. (Canines, upper, 2—3; lower, 1—1.)

6352. Port Jamelo. July 13, 1908. Length, 287 mm. (Canines, upper, 1—2; lower, 0—0.)

7298. Sablayan Bay, Mindanao. December 12, 1908. Length, 260 mm.

A. 693. Si Amil Island. September 26, 1909. Length, 240 mm. (Canines, upper, 2—2; lower, 1—2.)

9306. Silino Island. August 10, 1909. Length, 277 mm. (Canines, upper, 2—2; lower, 1—1.) Teeth white, lips blue, color carried backward under eye and becoming somewhat greenish; general tone of head somewhat lavender or pinkish, similar on abdominal region; blue median ventral line with more or less indistinct stripes of blue on three first scale rows above. Margins of verticals blue; base of dorsal and anal bluish green, body of dorsal dull bluish, rather orange shade next to blue margin and base; anal similar; purplish or orange stripe through ventrals.

A. 622. Simaluc Island. September 22, 1909. Length, 268 mm. (Canines, upper, 1—2; lower, 1—2.)

7686 and 7690. Ulugan Bay, Palawan Island. December 29, 1908. Length, 232 to 250 mm. (7686, canines, upper, 2—3; lower, 1—1; 7690, canines, upper, 3—3; lower, 0—0.)

8331. Buang Bay, Talijit Island. March 15, 1909. Length, 260 mm. (Canines, upper, 2—1; lower, 1—1.) Teeth white; lips blue, color continuing as stripe from upper corner of mouth, backward under eye, to edge of preopercular limb; head below with pink shades; blue stripe behind chin and blue area on lower edge of interopercle, not quite reaching margin; blue stripe along front and central or median ventral contour; general body color bluish green, scales with broad reddish stripes at base; red predominates below, blue falling into ill defined stripes, two above median. Front and margin of dorsal and anal, and edges of caudal lobes blue; body of dorsal dusky greenish orange, base blue; caudal with purplish shades, becoming more distinctly red in fork except at extreme tip of rays; stripes of lobes not very well defined; anal base blue or greenish, body purplish. Ventrals pale purplish, fronts blue, posterior rays much marked with blue. Pectorals blue, with purple shades in upper half.

A. 1045 and A. 1057. Tidore Island, south of Ternate. November 24, 1909. Length, 280 to 290 mm. (A. 1057, canines, upper, 2—1; lower, 0—0.) (A. 1045.) Similar in general to *Callyodon cyanogrammus* but yellow of side much clearer and more pronounced, no green bars or orange in scales. Teeth dusky rose, with strong angular teeth; upper lip orange, green stripe above; lower lip very broadly orange, area below corner almost equal to orbit, blue band runs across corner and behind chin inclosing red of lower lip; interopercles and breast and belly with strong orange wash, lower part of cheek and opercle behind with green wash; teeth and middle of opercle more or less dusky rose, green above and behind eye, through upper middle of side (about three rows under lateral line) base of scales with orange or red spot or bar, these become circular in outline on caudal peduncle where yellow fades out continued to pale green or blue; entire dorsal blue except broad median orange band; anal similar, with slightly darker colors; caudal pale green, narrow orange stripe through each lobe and broken bar of orange spots across base; pectoral purple, upper ray with blue shades, dusky superceding the color in distal lower portion, sulphur yellow across base with orange bar over pterygials; ventrals pale orange with blue front; iris golden, striped with green above by the upper green bar which extends forward over anterior nostril. (A. 1057.) Much duller than preceding, purplish wash of back extends to middle of soft dorsal. Caudal peduncle pale green, lines and spots slightly less distinct and rounded. Second row of spots on caudal fin. Yellow tint greenish, narrowly under rim of soft dorsal.

A. 1056 and 12934. Tidore Island. November 25, 1909. Length, 225 to 240 mm. (12934, canines, upper, 2—2; lower, 1—1.)

A. 1549. Nan Wan Bay, Formosa. January 25, 1910. Length, 290 mm. (Canines, upper, 1—1; lower, 2—2.)

A. 1616. Nafa, Riu Kiu Islands. February 7, 1910. Length, 315 mm. (Canines, upper, 3—1; lower, 1—1.)

51820 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. 1 example. Length, 280 mm. (Canines, upper, 1—1; lower, 0—0.) As *Callyodon bataviensis.*

55935 U.S.N.M. Zamboanga. Philippine Commission. 1 example. Length, 273 mm. (Canines, upper, 2—1; lower, 1—1; preopercle, 0—0; slight neutral spot at pectoral origin.) As *Callyodon oktodon.*

55991 U.S.N.M. Bacon. Philippine Commission. 1 example. Length, 213 mm. As *Callyodon balinensis.*

66014 U.S.N.M. Jaluit, Marshall Islands. *Albatross* collection. 1 example. Length, 225 mm. As *Scarus bataviensis.*

84197 U.S.N.M. Cebu. Dr. F. Baker. 1 example. Length, 203 mm. As *Callyodon pronus.*

52682 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. 1 example. Length, 343 mm. As *Callyodon gilberti.*

CALLYODON MUTABILIS Gray

Callyodon mutabilis Gray, Cat. Fish. Gronow, 1854, p. 86. Amboina.

Pseudoscarus mutabilis Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909 p. 316 (type; Samoa, Pelew Islands).

Pseudoscarus pentazona Bleeker, Verslag. Ak. Wet. Amsterdam, vol. 12, 1861, p. 241. Celebes; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 46, pl. 11, fig. 1 (Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 231 (compiled); Fishes of Zanzibar, 1865, p. 107 (Zanzibar).

Pseudoscarus schlegeli Bleeker, Verslag. Ak. Wet. Amsterdam, vol. 12, 1861, p. 242. Celebes; Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 48, pl. 12, fig. 2 (Celebes).

Pseudoscarus pentazona var. *schlegeli* Weber, Siboga Exp., vol. 57, Fische, 1913, p. 388 (Rotti).

Scarus cypho Seale, Occas. Pap. Bishop Mus., vol. 1, No. 3, 1900, p. 95. Agaña, Guam.

Depth 2½ to 2⅗; head 2¾ to 2⅘, width 2⅛ to 2¼. Snout 2⅖ to 2½; eye 6 to 7, 2⅖ to 2¾ in snout, 2 to 2¼ in interorbital; mouth cleft 5⅓ to 5⅞ in head; lips cover teeth; canines usually absent, sometimes 1 or 2 each side above, less frequently 1 each side below; interorbital 3 to 3⅕ in head, convex. Gill rakers 22+28, fine, slender, flexible, short.

Scales in lateral line, 17 or 18+5+2; 2 scales above lateral line, 6 below, 4 predorsal; cheek with 2 rows of scales, of which lower row of 5 scales, preopercle flange usually naked. Scales with 22 to 30 basal radiating striae, apical 24 to 26; circuli very fine.

D. IX, 10, 1, ninth spine 2⅞ to 3¾ in head, first ray 2⅘ to 3⅛; A. III, 9, 1, third spine 3⅛ to 4¼, first ray 2⅘ to 2⅞; caudal 1⅖ to 1½, slightly emarginate, ends little exerted, rounded obliquely in young; least depth of caudal peduncle 2⅛ to 2⅕; pectoral 1⅛ to 1⅕; ventral 1⅗ to 1⅔.

Adult pale yellowish-brown on upper surface of head and back anteriorly. Pale band 2 scales wide below first third of soft dorsal,

narrowing to little less below and reaching front of anal base. Otherwise entire lower surface of head, trunk, and rest of tail, brown. Iris yellowish. Teeth whitish. Dorsals grayish, with brown margin and median olive longitudinal streak. Anals grayish, with broad brown lower edge. Caudal grayish, with 3 transverse dull olive bands. Paired fins dull brown, with dusky spot at pectoral origin.

Zanzibar, East Indies, Philippines, Japan, Micronesia, Melanesia, Polynesia.

Young examples with body more or less uniform brown and traces of five vertical obscure, saddlelike blotches along side.

9622, 9624. Agojo Point, Catanduanes Island. June 10, 1909. [1634,1635.] Length, 206 to 217 mm. (9622, canines, upper, 2—1; lower, 0—0.) Teeth dusky white; lips, blue; nose and chin, orange, with green bands; yellow saddles on back; dorsal and anal with blue front and margin; body of fin orange red with central green band broken into round blotches posteriorly; caudal lobes blue edged, body reddish orange, green bar at base, and broken green bar through center.

11096, 11100, 16368. Agojo Point. Length, 155 to 220 mm. (11096, preopercle scales, 0—1; 16368, canines, upper, 1—1; lower, 0—0.)

8914. Atulayan Island. June 18, 1909. Length, 264 mm. (Canines, upper, 2—2; lower, 0—1.)

8793, 19184, 19187. Butauanan Island. June 12, 1909. Length, 192 to 240 mm. (8793, canines, upper, 2—1; lower, 1—1; 19187, preopercle scales, 0—1.)

9944. Biri Channel. June 1, 1909. Length, 211 mm. [1566.] (Canines, upper, 0—1; lower, 0—0.) Olive gray; margins of scales brownish; teeth white; front of head with more or less red shades; band across nose passing backward under eye olivaceous; lower lip and chin stripe slightly olive; front and margin of dorsal and anal slaty; body of dorsal dull reddish, with large olive green blotches in centers of membranes; anal somewhat reddish, with obscure greenish median bar; caudal reddish, with two obscure bars near base; paired fins about same as body color.

8650. Biri Channel, Balicuatro Island. June 2, 1909. Length, 263 mm. (Canines, upper, 2—2; lower, 1—2.) Bright verdigris green band across tip of snout and backward through eye to upper angle of gill opening, on level and backward to middle of body line separates the anterior half into a greenish region above and purplish one below; through middle of side purplish bar from dorsal to front of anal, behind green bar of about two scales width, thence purplish again; in life purplish appears much darker, almost black; upper anterior portion of body and top of head showing very pale in contrast. Teeth dusky, scarcely greenish; lips narrowly blue; blue throat line continued backward to vent; dash of green in front of opercle and stripe along center of same. Vertical fins blue edged, anal and dorsal with blue central bar, body of fins purplish; two or three broken greenish bands across purple of caudal; fronts and last two rays of ventrals blue, body of fin purplish; pectorals hyaline purplish, without distinct stripes, base somewhat greenish.

8644 and 8645. Biri Channel, Balicuatro Island. June 2, 1909. Length, 263 to 273 mm. (8644, canines, upper, 2—0; lower 0—0; 8645, canines, upper, 3—0; lower, 0—0.) Teeth white, with slight bluish shade; general shades verdigris, margins of scales with geranium pink or purplish; head generally suffused with reddish; lips blue or greenish; green band across snout, passing

backward under eye and fading across opercle; double green stripe behind eye above; chin band of green; throat and median breast with blue stripe extending to anal fin; greenish of abdomen falling into stripes through scale rows. Front and margins of dorsal and anal and edges of caudal lobes blue; body of dorsal purplish, with slight orange shade distally and anteriorly, irregular green blotches through center of membranes except first; anal similar but more generally bluish, central spots nearly blue; caudal similar, with about three broken bars of green across center; anal front and posterior rays blue, membranes and second ray blue; pectoral hyaline with rosy purple shade, greenish at base and first ray; two yellow bars on back, first under last three spines, second under third to fourth soft rays, extending slightly below lateral line.

8664. Same data. Length, 180 mm. Slaty gray to purplish; teeth dusky; dull greenish stripe across snout and preopercle to eye; similar stripe across chin; side shows two or three paler bars posteriorly; margin of caudal slaty; body reddish, with median obscure bar; caudal tipped with blackish; body of fin reddish, with one or two pale bars near base; median bar in anal scarcely apparent.

12093. Capunuypugan Port, Mindanao. May 10, 1908. Length, 146 mm. (Preopercle 0—0.) An unusually swarthy example.

6248. Galera Bay. June 9, 1908. Length, 228 mm. Teeth dusky, pinkish at base. Lower lips and chin band slate. Dorsals and caudal with reddish shades, with central bronzed area.

8226. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 243 mm. (Canines, upper, 2—1; lower, 1—1.)

4580. Grande Island Reef, Subig Bay. January 8, 1908. Length, 245 mm.

5178. Jolo. March 7, 1908. Length, 172 mm.

9012. Langao Point, extreme south of Luzon. June 24, 1909. Length, 252 mm. (Canines, upper, 3—3; lower, 1—0.) Alternate pale and dark bars on side; caudal dark red brown, slaty bars across its middle and pale spots below and basally; dorsal edged slaty, greenish bar through center on membranes, reddish above and below; anal similar but less pronounced; reddish about nose and chin, with slaty bands; top of head more or less mottled on fading.

9000. Same data. Length, 234 mm. (Canines, upper, 0—1; lower, 0—0.)

6074. Little Santa Cruz Island. May 28, 1908. Length, 260 mm. (Canines, upper, 2—1; lower, 1—1.)

14691. Maculabo Island. June 13, 1909. Length, 219 mm. (Canines, upper, 1—1; lower, 0—0.)

7879, 14574, 14578, 16367, 16369. Maculabo Island. June 14, 1909. Length, 153 to 218 mm. (14574, preopercle, 0—0.)

9273. Murcielagos Bay, Mindanao. August 9, 1909. Length, 213 mm.

9355. Murcielagos Bay. August 21, 1909. Length, 270 mm.

6189 and 17325. Palag Bay vicinity, Luzon. June 16, 1909. Length, 205 to 222 mm. (6189, canines, upper, 1—1; lower, 1—1.)

10742. Port Ciego, Balabac. June 3, 1909. Length, 200 mm.

6945. Port Galera, Mindoro. June 9, 1908. Length, 178 mm. (Preopercle, 0—0.)

8982. Porongpong Island, Palumbanes Group. June 10, 1909. Length, 170 mm.

8964, 8965. Rapurapu Island and Strait. June 22, 1909. Length, 254 to 262 mm. (8964, canines, upper, 1—1; lower, 0—0; 8965, canines, upper 2—2; lower, 1—0.)

9305. Silino Island. August 10, 1909. Length, 255 mm. (Canines, upper, 2—2; lower, 0—0.) Teeth dusky; lips slaty, chin dusky orange, with broad slaty bar; dusky greenish bar across snout joins color of lower lip at angle of

mouth and passes upward to eye; ground color of snout more or less orange; general body color olive brown, reddish at base of scales shows upon fading. Dorsal front and margin slaty; body dusky orange, with row of dusky green blotches through center on membranes, only crossing base of some of soft rays. Caudal similar in general tone to dorsal, also anal, but without green central bar. Paired fins body color; membranes of pectoral hyaline, upper ray darkest.

A. 667. Sitanki Reef. September 24, 1909. Length, 240 mm. (Canines, upper, 1—1; lower, 2—2.)

7848. Taganak Island. January 7, 1909. Length, 283 mm. (Canines, upper, 1—1; lower, 1—1.)

7961. West Coast of Palaui Island. November 18, 1908. Length, 194 mm. (Canines, upper, 1—2; lower, 0—0.) Very dark green; scales on side and posteriorly with narrow red bases; ventral surfaces with lilac overshades. Teeth pale greenish. Upper lip bright green; lower lip blue with suggestion of orange edge; blue continuous with green bar across lower cheek to pectoral base; obscure pinkish bar across interopercle and on lower bronchiostegal membranes bounding blue throat line. Front and margin of dorsal, anal, caudal edges, and front of ventrals, also upper pectoral ray, blue; dorsal with body purplish green, posterior half with central bar of interrupted blotches; caudal base purple; anal like dorsal, but paler, green bar almost central from third spine to penultimate ray; last dorsal and anal ray greenish. Pectorals green, with purplish shades. Ventrals similar, but paler.

57666 U.S.N.M. Japan. P. L. Jouy. 2 examples. Length, 160 to 225 mm.

CALLYODON MICROCHEILOS (Bleeker)

Scarus microcheilos Bleeker, Verslag. Kon. Akad. Wet. Amsterdam, vol. 12, 1861, p. 231. Java.

Pseudoscarus microcheilos Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 24, pl. 4, fig. 2 (Java).

Depth 2⅖ to 2⅗; head 2⅗ to 2¾, width 2¼ to 2⅓. Snout 2$\frac{1}{10}$ to 2⅙; eye 7⅛ to 8⅕, 3⅖ to 3¾ in snout, 2½ to 2⅘ in interorbital; mouth cleft 4¼ to 5⅔ in head; canines small, 2 above each side, none below in our examples; lips narrow, only cover basal third or fourth of teeth; interorbital 3 to 3¼, convex, with slight prominence above small nostrils. Gill rakers 20+35, short, weak, flexible, lanceolate.

Scales in lateral line 17 or 18+4+2; 2 scales above lateral line, 6 below, 4 predorsal; cheek with 3 rows of scales, none on suborbitals or preopercle flange. Scales with 44 to 57 basal radiating striae, apical 42 to 50; circuli very fine.

D. IX, 10, 1, ninth spine 2⅔ to 3$\frac{1}{10}$ in head, first ray 2⅔ to 2⅞; A. III, 9, 1, third spine 3⅞ to 4, first ray 2⅘ to 3½; caudal 1¼ to 1⅓, well emarginate behind; least depth of caudal peduncle 2⅕ to 2½; pectoral 1⅓ to 1⅖; ventral 1¾ to 1⅘.

Largely uniform dark brown, scarcely lighter below. Teeth greenish. Iris yellowish brown. Fins all neutral brown. Dorsals and anals with brown border and median brown or greenish band longitudinally. Ventrals little paler than pectorals.

Known only from the East Indies, and the Philippines as listed below. It appears to differ from *Callyodon microrhinos* in the even convex upper profile anteriorly and the presence of a blue or green median longitudinal band on both dorsals and anals.

8111. Alimango Bay, near ship's anchorage. March 5, 1909. Length, 243 mm. (Canines, upper, 2—2; lower, 0—0.)

6524. Port Maricaban. July 21, 1908. Length, 252 mm. (Canines, upper, 2—2; lower, 0—0.)

4943. Tataan, Tawi Tawi Group. February 20, 1909. Length, 345 mm. (Canines, 1—1; lower, 0—0.) General color emerald green, becoming darker green on top of head; scales bounded by dark dahlia purple, lower parts with lilac shades; upper and lower lips bright beryl green; teeth very pale green; chin with beryl band, separated from lip by greenish buff. Median stripe of greenish blue on the branchiostegal junction; from the corner of mouth backward toward pectoral broken stripe of beryl; orbit edged with same. Dorsal bright green at base, body of fin yellowish green; on front and top blue band set off by a submarginal black line; series of round green blotches in centers of membranes of posterior half. Caudal with blue on edges and tip within fork, lobes and distal half beneath bright emerald green, base purplish. Anal purplish green, front and margin with blue band about width of pupil resting on black; vertical edge and base bright green, and bright green bar through middle. Ventral pale blue, front margin bright. Pectoral dull greenish blue, becoming hyaline distally below, with purplish shades through center above. Iris bronzy.

A. 975. Binang Unang Island, Dutch East Indies. November 17, 1909. Length, 320 mm. (Canines, upper, 0—1; lower, 0—0.)

CALLYODON MICRORHINOS (Bleeker)

Scarus microrhinos Bleeker, Nat. Tijds. Ned. Indie, vol. 6, 1854, p. 200. Batavia, Java.

Pseudoscarus microrhinos Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 22, pl. 3 (Java and Celebes).

Pseudoscarus microrhinus Bleeker, Ned. Tijds. Dierk., vol. 4, 1874, p. 116 (China).

Pseudoscarus microrhinus Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 322, pl. 156 (Ponape, Ruk, Mortlock, Fiji, Samoa, Society Islands).

Scarus frenatus (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 22 (name in synonymy).

Callyodon ultramarinus (Jordan and Seale) Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, 1906, p. 63, fig. 16 (head). Mangareva, Gambier Islands; Apia, Samoa.

Depth 2⅖ to 2⅔; head 2⅗ to 2⅔, width 2⅓ to 2½. Snout 2 to 2⅛; eye 7 to 8 (5 in young), 3 to 4 in snout (2⅕ in young), 2⅛ to 3 in interorbital (1⅔ in young); mouth cleft 4 to 5 in head; lips cover only basal third of teeth; canines absent, or usually 1 or 2 above each side; interorbital 3 to 3⅕, convexly elevated, with gibbous prominence close before and above small nostrils, of which, posterior only twice size of anterior in adults. Gill rakers 20+35, flexible, slender.

Scales in lateral line 18 or 19+4 or 5+2; two scales above lateral line, 6 or 7 below, 4 predorsal; cheek with 3 rows of small scales,

suborbitals and preopercle flange broadly naked. Scales with 36 to 39 basal radiating striae, edge trilobate; apical striae 28 to 31; circuli very fine.

D. IX, 10, 1, ninth spine 2⅘ to 2⅞ in head, first ray 2½ to 2⅗; A. III, 9, 1, third spine 3¼ to 3⅔, first ray 2¾ to 3; caudal 1⅓ to 1⅔, deeply emarginate, with upper and lower points exserted, but slightly so in young; least depth of caudal peduncle 2¼ to 2⅕; pectoral 1⅔ to 1⅔; ventral 1¾ to 1⅘.

Back and upper surface dull olivaceous, light vinaceous cinnamon on under surface of head and abdomen. Pale olive yellow or citron yellow band from rictus back across cheek horizontally towards pectoral origin, also extends to lower lip. Sometimes yellow spot each side of throat in young examples. Lips pale. Iris tawny olive. Teeth green. Fins gray brown. Dorsals and anals with pale edge and caudal with subterminal pale crescent. Pectoral with upper edge olive, deep or dusky terminally. Ventral quite pale.

East Indies and China to the Society and Gambier Islands.

5057. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 157 mm.

8106. Alimango Bay. March 5, 1909. Length, 500 mm. (Canines, upper, 1—1; lower, 0—0.)

8930. Atulayan Island, Lagonoy Gulf. June 18, 1909. Length, 480 mm. (Canines, upper, 2—1; lower, 0—0.)

6495. Balikias Bay. July 17, 1908. Length, 260 mm. Teeth green. General color green; bases of scales dusky reddish. Side and top of head olive. Upper lips green, also lower; drab spot and band behind chin; lower surface of head and body bluish; green from mouth corner across to subopercle edge. Dorsal and anal front and margin blue, bluish green at bases, body of fins dusky reddish with central green band.

8662. Biri Channel. June 22, 1909. Length, 298 mm. (Canines, upper, 0—1; lower 0—0.)

8076. Burias Island. March 5, 1909. Length, 458 mm. (Canines, upper, 1—1; lower, 0—0.)

7863. Cagayan, Sulu. January 8, 1909. Length, 336 mm. (Canines, upper, 1—0; lower, 0—0.) Teeth green; general color green, with bases of scales with obscure geranium pink vertical bar; upper lip bright green, lower bluish, becoming green at corner of mouth and green extending backward across lower edge of cheek near lower base of pectoral; throat line pale blue; lower surfaces paler, with more or less lilac wash. Dorsal margin, front and base blue, body of fin purplish, without definite markings. Edge of caudal lobes blue, distal half of fin in fork greenish, slightly dusky at tips; basal portion of middle of lobes purplish. Anal similar to dorsal except basal blue. Ventral fronts blue, remainder of fin more or less purplish. Pectoral greenish, broad purplish stripe through upper portion, tips of upper six rays blackish. Dash of blue on upper eye. Iris silvery.

9244. Camp Overton. August 6, 1909. Length, 405 mm. (Canines, upper, 1—1; lower, 0—0.)

8224 and 8225. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 505 to 600 mm. (8224, canines, upper, 1—1; lower, 0—0; 8225, canines, upper, 1—1; lower, 0—0.)

17444. Mompog Island, Anabayas Island. March 3, 1909. Length, 215 mm. [1210.]

8045. Same data. Length, 379 mm. (Canines, upper, 1—0; lower, 0—0.)

6522 and 6523. Port Maricaban. July 21, 1908. Length, 388 to 500 mm. (6522, Canines, upper, 1—1; lower, 0—0.)

7003. Port San Pio Quinto. November 10, 1908. Length, 483 mm. (Canines, upper, 1—1; lower, 0—0.) Teeth light green, dusky basally, whitish marginally. Scales of anterior back, sides and nape olivaceous with brown vertical submarginal stripes; scales of posterior back and belly, also caudal peduncle, viridian green with brown markings as above; brown markings disappearing below line from base of pectoral to hind anal base. Upper lip with blue green stripe; chin-band and line from mouth corner to pectoral base greenish blue to emerald; cheek above line dark olivaceous, below light central area merging into belly color below and stripe color above. Orbit olivaceous above, blue green below. Iris golden, with dusky inner ring. Dorsal dusky emerald green basally, greenish blue along edges; body of membranes dusky olivaceous with central spot size of eye green in each. Caudal green, with blue edge and margin. Ventral blue, with pale greenish center. Tips of upper pectoral rays dusky, lighter below. Anal like dorsal.

7307. Sablayan Bay, Mindoro. December 12, 1908. Length, 454 mm. (Canines, upper, 1—0; lower, 0—0.)

7349. Tara Island. December 14, 1908. Length, 308 mm.

4943. Tataan Island, Tawi Tawi Group. February 20, 1908. Length, 343 mm.

6409. Tilig, Lubang. July 14, 1908. Length, 320 mm. (Canines, upper, 1—1; lower, 0—0.)

6457 and 6477. Tilig Bay. July 15, 1908. Length, 255 and 328 mm. (6457, canines, upper, 1—0; lower, 0—0.) (6457.) Shows narrow orange border to lips.

7161. West coast of Palaui Island. November 18, 1908. Length, 457 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 974. Binang Unang Island, Dutch East Indies. November 17, 1909. Length, 323 mm. (Canines, upper, 1—1; lower, 0—0.) General color much darker than usual. Margins of dorsals and anals and fronts of ventrals bright blue. Dorsal with median green band. Caudal with extreme tip in fork bluish. Purple stripe in pectoral indistinct. Two brownish bands across chin, otherwise green.

8328. Same locality. March 15, 1909. Length, 482 mm. (Canines, upper, 1—1; lower, 0—0.)

6987. Length, 381 mm. Green, bases of lateral scales with reddish. Upper lip bright green, lower lip stripe across chin and along throat blue; bright green stripe from mouth corner to pectoral base, purplish below. Dorsal olivaceous, front and edge bright blue. Caudal greenish, edges bluish, base with purplish shades. Anal greenish, front edge and last ray blue, blue spots under basal scales. Ventral front blue, rest of fin blue green. Pectoral greenish, undefined stripe of purple through lower part of upper half. Green over eye. Teeth green.

51758 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Type of *Callyodon ultramarinus*.

CALLYODON HARID (Forskål)

Scarus harid Forskål, Descript. Animal., 1775, pp. x, 30. Arabia.

Pseudoscarus harid Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 220 (East Indies).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 45 (Ceylon, Bombay, Seychelles, Red Sea).—Günther, Fishes of Zanzibar, 1865, p. 104 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 561 (Red Sea).—Peters, Monatsb. Akad. Wiss. Berlin,

1876, p. 443 (Mauritius).—Day, Fishes of India, pt. 3, 1877, p. 411.—Günther, Philos. Trans. Roy. Soc. London, vol. 168, 1879, p. 470 (Rodriguez).—Day, Fauna British India, vol. 2, 1889, p. 424.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 306 (Pelew Islands, Ponape, Ruk, Samoa).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 385 (Binongka).—Bamber, Journ. Linn. Soc. London, vol. 31, 1915, p. 482 (west shores of Red Sea).

Pseudoscarus (*Scarus*) *harid* Guichenot, Mem. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, 1866, p. 147 (Madagascar).

Scarus (*Pseudoscarus*) *harid* Martens, Verh. zool. bot. Ges. Wien, vol. 16, 1866, p. 379 (Kosier, Red Sea).

Scarus mastax Rüppell, Atlas Reise Nördl. Afr. Fische, 1828, p. 80, pl. 21, fig. 2. Ras Mehamed, Jubal and Gimsche.

Pseudoscarus mastax Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 35, pl. 10, fig. 1 (Java).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 44 (Red Sea, Botta Island, Dove Island).

Pseudoscarus harid var. *mastax* Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 562 (Koseir, Red Sea).

Scarus longiceps Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 241. Waigiu.

Pseudoscarus longiceps Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 42 (type).

Scarus latus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 245. Red Sea.

Scarus wurk (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 245. (Name in text, on *Scarus mastax* Rüppell.)

Scarus ruppelii Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 259. Red Sea.

Scarus cyanurus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 261. Djedda.

Petronason longicauda Swainson, Nat. Hist. An., vol. 2, 1839, p. 226. (On *Scarus mastax* Rüppell, pl. 21, fig. 2.)

Pseudoscarus nigripinnis Günther, Fishes of Zanzibar, 1866, p. 105, pl. 15, fig. 2. Zanzibar.

Depth 2½ to 2⅞; head 2⅚ to 5⅛, width 2¼ to 2⅖. Snout 1$\frac{9}{10}$ to 2⅛; upper profile but slightly convex; eye 5¾ to 7½, 2⅔ to 3¾ in snout, 1⅖ to 1⅞ in interorbital; mouth cleft 4¼ to 5 in head; lips cover teeth; no canines below usually, above 0 to 3 each side; interorbital 3⅔ to 4, broadly convex. Gill rakers 17+37, fine, flexible, short.

Scales in lateral line 18+9+2; 2 scales above lateral line, 7 below, 4 or 5 predorsal; cheek with 3 rows of small scales, suborbitals and preopercle flange broadly naked. Scales with 39 to 42 basal radiating striae; apical 12 to 14, obsolete; circuli very fine.

D. IX, 9, 1, ninth spine 2⅘ to 3 in head, first ray 2¾ to 3; A. III, 9, 1, third spine 3⅗ to 4, first ray 3¼ to 3⅔; caudal 1⅕ to 1⅖, double concave behind, tips exserted; least depth of caudal peduncle 2⅗ to 2¾; pectoral 1⅔ to 1½; ventral 1⅗ to 1⅔.

Uniform pale brown, under surface of head, breast, and belly pale to cream-white. Teeth white. Iris yellowish. Fins all pale brown,

edges of dorsals and anals with grayish margins whole extent. Now no trace of yellow line back from rictus and 2 or 3 from hind eye edge, or the dark gray median longitudinal line on both dorsals and anals, as shown in Rüppell's figure.

Red Sea, Mauritius, India, East Indies, Micronesia, Polynesia.

8941 and 8942. Between Paron and Jesus Points, Albay Gulf, Luzon. June 2, 1909. Length, 370 to 420 mm.

8625, 8629. Biri Channel. June 1, 1909. Length, 290 to 340 mm.

8657. Biri Channel. June 22, 1909. Length, 344 mm.

8798. Butauanan Island. June 12, 1909. Length, 267 mm.

7768. Candaraman Island. January 4, 1908. April 17, 1908. Length, 287 mm. General color dusky pink, perhaps much faded; head apparently darkest; lower head and breast rather brighter red; teeth dusky rose; dorsal and anal with obscure or no bars, apparently ill-defined bar through center of each, possibly another near margin; caudal peduncle and caudal fin yellowish; paired fins plain.

5379. Cebu Market. April 6, 1908. Length, 177 mm. General color of side pearly to rose, becoming pale with yellowish wash below; head with orange shades; from nape around edge of opercle and below base of pectoral irregular seal brown spots; narrow lines of seal brown across interorbital from front of eye down to preorbital, to front of cheek, broken across interorbital region; head in front of this more yellow than orange, behind more orange; lips yellowish; teeth rosy at base, tubercles white; breast washed with orange. Dorsal dusky rose, somewhat more dusky on upper edge, tips of rays white; large blotch on the 3d to 7th spines, center black, edge irregularly orange covering most of depth of fin. Caudal body color clouded with orange near edges of lobes, tip whitish. Anal sulphur yellow, ventral same. Pectoral hyaline orange. Iris orange red.

8760. Lahuy Island. June 11, 1909. Length, 390 mm.

8846. Maculabo Island. June 14, 1909. Length, 520 mm. (Canines, upper, 2—2; lower, 0—0.)

9088. Malhon Island. July 27, 1909. Length, 375 mm.

6135 and 6136. Mansalay. June 4, 1908. Length, 475 to 495 mm. (Both have canines, upper, 1—1; lower, 0—0.) Teeth white. Dusky green on back, becoming whitish with traces of purple and smoke below; margins of scales broadly pale orange; caudal peduncle yellowish green above on sides; top of head dark olive, with purplish shades, becoming purple on snout; upper lip broadly orange, running back above corner of mouth; side of head smoky purplish, with orange shades about eye; dull smoky greenish stripe just behind eye; chin yellow, becoming yellowish buff on throat and interopercle; dull orange lower border on opercle. Dorsal front and margin slaty, spines purplish gray and membranes orange; fin posteriorly mainly orange, much mottled with roundish spots of purplish. Caudal yellowish olive, with red and purple shades. Anal orange, with series of translucent and purplish blotches through center, and with front and margin of similar shades. Ventral pale, with orange wash, upper ray of pectoral purplish, upper half of fin below orange with geranium pink shades basally; lower half hyaline with dusky purplish orange shades. Iris golden.

9268 to 9270. Murcielagos Bay. August 9, 1909. Length, 375 to 412 mm. (9268, canines, upper, 3—3; lower, 0—0; 9270, canines, upper, 3—3; lower, 0—0.)

8877. Near Palag Bay, Luzon. June 16, 1909. Length, 267 mm.

8190. Port Busin, Burias Island. March 8, 1909. Length, 310 mm.

8384. Port Dupon, Leyte Island. March 17, 1909. Length, 218 mm. Pale gray and greenish shades; white on lower head and belly, with slight pink wash; teeth white; no marks or bars apparent on body, possibly having faded; dorsal very pale hyaline straw, front and margin of central band pale lilac; caudal yellowish, edges of lobes and tip within fork lilac; anal pale straw, front and margin whitish lilac; ventrals pale, fronts slight lilac shade; pectorals hyaline straw, first ray slightly bluish.

8772 and 8773. Quinalasag Island. June 12, 1909. Length, 285 to 287 mm.

5277. Romblon Harbor. March 25, 1908. Length, 269 mm. Gray with greenish mottlings and stripes on centers of scales, brownish at base on sheath; below washed with rosy; caudal peduncle posteriorly with sulphur yellow wash; top of head dusky olive; chin rosy; short reddish stripe in corner of mouth above, greenish below; teeth white. Dorsal edged with blue, body of fin orange; greenish central obscure bar. Caudal greenish yellow, edged with purplish and tipped in fork with hyaline and dusky. Anal margined with purplish, body of fin orange anteriorly, with purplish central bar; purplish at base of membranes. Ventral rosy, somewhat mottled with more intense color, purplish on front. Pectoral hyaline below to pale yellow above, upper rays green and purplish on basal portion. Opercle margined with dull orange. Iris golden.

7321. Sablayan Bay, Mindoro. December 12, 1908. Length, 391 mm. (Canines, upper, 2—1; lower, 0—0.)

15758. Sacol Island. September 9, 1909. Length, 178 mm.

A. 648. Simaluc Sibi Sibi Island. September 23, 1909. Length, 334 mm.

A. 600 and A. 601. Singaan Island. September 21, 1909. Length, 393 to 400 mm. (A. 600, canines, upper, 1—1; lower, 0—0; A. 601, canines, upper, 2—1; lower, 0—0.)

A. 451 and A. 452. Tulnalutan Island. September 9, 1909. Length, 479 to 508 mm. (A. 451, canines, upper, 1—1; lower, 0—0; A. 452, canines, upper, 2—1; lower, 0—0.)

A. 1115. Ternate market. November 26, 1909. Length, 369 mm. (Canines, upper, 0—1; lower, 0—0.)

30590 U. S. N. M. New Guinea. Australian Museum. 1 example. Length, 135 mm.

30621 U. S. N. M. New Guinea. Australian Museum. 1 example. Length, 190 mm.

CALLYODON PULCHELLUS (Rüppell)

Scarus pulchellus Rüppell, Neue Wirbelth., Fische, 1835, p. 25, pl. 8, fig. 3. Djedda, Red Sea.

Pseudoscarus pulchellus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 34, pl. 10, fig. 3 (Java, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 219 (Mauritius, China).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 559 (Koseir, Red Sea).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 558 (Luzon, Cavite, Santa Cruz).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 305 (Pelew Islands and Ponape).

Pseudoscarus pulchellus var. *bicolor* (not Rüppell) Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 560 (part).

Pseudoscarus bicolor (not Rüppell) Weber, Siboga Exp., vol. 57, Fische, 1913, p. 384 (part).

Depth 2⅗ to 2⅔; head 2⅔ to 2⅘, width 2⅕ to 2¼. Snout 1⅘ to 1⅞; eye 8⅙ to 8¾ 5 in snout, 2¼ to 2⅔ in interorbital; mouth cleft 3⅖ to 3⅔; lips completely cover teeth; no canines;

hind nostril greatly larger than front one, nearly equals pupil; interorbital 3¾ to 4, broadly convex. Gill rakers 8+14, firm, short, in lower branch broadly and transversely triangular.

Scales in lateral line 17 to 19+5 or 6+2; 2 scales above lateral line, 7 below, 7 predorsal; cheek with 3 rows of small scales, leaving suborbitals and preorbital, also preopercular flange broadly naked. Scales with 63 to 65 basal radiating striae; apical 24 to 27, obsolete, imperfect; circuli fine.

D. IX, 9, 1 or 10, 1, ninth spine 3⅛ to 3⅞ in head, first ray 2⅔ to 3; A. III, 9, 1, third spine 3½ to 4⅖, first ray 3⅓ to 3½; caudal 1¼ to 1⅓, deeply emarginate, tips exserted; least depth of caudal peduncle 2⅓ to 2⅖; pectoral 1½ to 1⅗; ventral 2 to 2⅕.

Brown, generally little paler below. Each scale on back and entire upper half of head till level with pale line from rictus horizontally to pectoral origin, covered with small, close-set, round, gray spots, each with dark bordering line; spots on muzzle small and rather sparse, larger, irregular and closer on interorbital. Iris orange buff. Dorsals neutral brown, border paler, also some pale spots on hind portion of soft fin basally. Anal grayish, base and border paler. Caudal pale brown, with round basal grayish spots. Pectoral dusky brown, with few pale gray scattered spots. Ventral pale brownish.

Red Sea to the East Indies and Micronesia.

7450. Bolalo Bay. December 21, 1908. Length, 558 mm.

7543. Endeavor Strait. December 23, 1908. Length, 506 mm.

8514. Makesi Island, Palawan. April 5, 1909. Length, 506 mm.

8750. Porongpong Island. June 10, 1909. Length, 530 mm.

7250. Port Matalvi. November 25, 1908. Length, 473 mm. Teeth white. General color green; upper lip, chin, lower head, breast, and belly geranium red to pale coral; bases of posterior scales red, entirely bordering scales on tail and caudal peduncle; upper head, anterior back, and side with numerous orange vermilion spots about one-fourth diameter of pupil, fine to broad reticulating lines on top of head; orange of upper lip extends at irregular line to pectoral base. Dorsal green, edged blue, elliptical or irregular blotch of red on lower half of each membrane, and last two rays largely orange. Anal with orange vermilion base and green terminal two-fifths, divided by blue, and fin front and edge blue. Caudal lobes edged blue, orange vermilion through center, uniting at base of fin; medial crescent yellow green centrally, blue at edges, and posterior orange band or crescent, also within inner fork of fin blue. Pectoral royal purple, with line of bright blue spots; edge of fin dusky, and axil yellow, with orange stripe across outer base. Ventral front pale blue, body lemon yellow.

A. 604. Singaan Island. September 21, 1909. Length, 394 mm.

A. 856. Limbe Strait, Celebes. September 9, 1909. Length, 503 mm.

CALLYODON DIMIDIATUS (Bleeker)

Scarus dimidiatus Bleeker, Act. Soc. Ind. Néerl. (No. 2), vol. 6, 1857, p.(5) 17. Doreh, New Guinea.

Pseudoscarus dimidiatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 41, pl. 16, fig. 1 (New Guinea).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 308 (Pelew Islands and Ponape).

Callyodon fumifrons Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 326, pl. 25. Pago Pago, Samoa.

Depth 2½ to 2⅔; head 2⅘ to 3, width 2$\frac{1}{10}$ to 2⅕. Snout 2$\frac{1}{10}$ to 2⅛; eye 6¾ to 7½, 3⅓ to 3⅗ in snout, 2½ to 2¾ in interorbital; mouth cleft 3½ to 3⅞ in head; lips cover ⅔ to ¾ of teeth; canines usually absent, vary 1 or 2 above each side and 1 below each side; interorbital 2⅗ to 2⅘ in head. Gill rakers 17+27, short, feeble points.

Scales in lateral line 18 or 19+5+2; 2 scales above lateral line, 6 or 7 below, 6 or 7 predorsal; 3 rows of cheek scales, of which lowest row of 2 or 3 scales on preopercle flange. Scales with 35 to 40 basal radiating striaē, apical 28 to 65; circuli fine.

D. IX, 10, 1, ninth spine 3⅕ to 3¼ in head, first branched ray 3 to 3⅕; A. III, 9, 1, third spine 3⅕ to 3¼, first branched ray 2¾ to 2⅘; caudal 1¼ to 1⅓, slightly emarginate, truncate as expanded; least depth of caudal peduncle 2 to 2$\frac{1}{10}$; pectoral 1¼ to 1⅖; ventral 1⅞ to 2.

Anterior half of body pale brown nearly to end of depressed pectoral, posteriorly all darker brown. Upper lip broadly pale brown. Yellowish streak from above rictus to eye, then curved down toward pectoral origin; above pale yellowish streak, broad dusky band back from eye toward pectoral axil, expanding little behind and bordered above by yellowish line from behind eye; front of head to beginning of predorsal squamation dark brown. Edges of dorsals dull olive, fins medianly and basally variegated with grayish and dull greenish. Anal largely dull greenish; narrowly grayish basally. Caudal and ventral dull brown. Pectoral pale greenish, with broad median grayish band.

East Indies, Melanesia, Micronesia, Samoa. Easily known by the pale anterior half of the body and the yellowish arc along side of head, touching lower edge of eye and reaching toward pectoral fin.

6723, 8160. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 213 to 228 mm.

11289. Alimango Bay, Burias Island. March 5, 1909. Length, 200 mm.

5434. Off Bohol. April 8, 1908. Length, 205 mm. Teeth white. Upper lip pale, extends to eye as narrow brown line. Snout and chin blue.

7459. Bolalo Bay, Palawan Island. December 21, 1908. Length, 272 mm. Viridian; front and head with bluish tones; slaty bar through eye to behind opercle; yellowish in green below; two orange or reddish bars on dorsal.

8329. Buang Bay, Talajit Island. March 15, 1909. Length, 290 mm. Lips blue, upper edge pink. Snout smoky purple, band extending through eye to opercle angle; under smoky purple of snout green stripe, margined darker, also extending below opercle angle, in posterior end green stripe elongate orange blotch; rest of cheek olive. Front part of back green; from seventh and eighth dorsal spines deep smoky green band across side; below hind part of dorsal deep smoky green; margins of scales in posterior two-thirds of body geranium red. Dorsal edge blue over orange, median band green, base violet. Caudal green, edge blue. Anal edge narrowly blue with outer part green, base violet, edged outwardly with darker. First 3 pectoral rays green, edged darker, fin purple medially, greenish below and hyaline at hind edge. Ventral blue along anterior edge, rest of fin greenish and hyaline posteriorly. Olive below pectoral, bluish on chin and breast.

5619. Burias Island, Busin Harbor. April 23, 1908. Length, 260 mm. General color dark green, posterior edges of scales with geranium red lines; lips, chin, and under side of head rich caerulean blue; dorsal with broad blue margin, then red zone, then green, red at base; caudal caerulean blue; anal caerulean blue, subbasal bar of scarlet from first to last rays; ventral caerulean, posterior part pale red; pectoral blue, with broad submarginal band of red.

5662. Same data. Length, 250 mm.

7772 and 773. Candaraman Island. January 4, 1909. Length, 215 to 217 mm. Teeth white; slaty stripe behind eye; green below under eye and on to chin; yellowish under green on opercle.

4805. Capulaan Bay near Lucena, Tayabas. 12-foot Agassiz dredge in 12 fathoms. D. 5368. Length, 324 mm. Top of head behind eyes backward to middle of spinous dorsal viridian green; lower parts beryl to blue; above and backward shading to emerald green, brightest on caudal peduncle and caudal fin. Edges of scales above and behind pectoral mauve. Top of head in front of eyes smoky slate; tip of snout beyond sky blue. Teeth white. Oblique bar of slate from eye to tip of opercle; another bar across opercle from eye to base of pectoral pale olive buff, with emerald green edge entirely surrounding about one-half width of pupil; green continued as an oblique bar from eye to corner of mouth; rest of cheek slaty blue. Dorsal fin of general color of body, tip bluish; two bars of mauve slightly less than diameter of pupil beneath; few irregular spots of same color on soft part, between bars and covering hinder rays. Terminal two-thirds of anal emerald green, becoming bluish on tip and with mauve bar above base. Ventral green; spines and tips of first rays bluish. Pectoral viridian, merging into bluish, with slaty purplish stripe through center, slightly broader than eye.

5419. Cebu market. April 7, 1908. Length, 280 mm. Posteriorly green, pink vertical line at base of each scale; diffuse yellow blotch on caudal peduncle running somewhat forward; anterior half without green, with rosy or heliotrope wash; top of head slaty olive, emerald green on first three scales in front of dorsal; upper lip broadly green, stripe passing backward under eye across to point of opercle about breadth of eye; lower lip blue; band behind chin green, blue centrally down throat and backward to vent, interrupted at ventrals. Front and tip of dorsal china blue, on orange of the same breadth, then pale green, basal half with purplish shades; posteriorly largely orange. Caudal orange, edges of lobes china blue; horseshoe of same color in fork. Anal china blue front and edge for nearly the breadth of eye; blue at base and on last ray, remainder of fin purplish. Ventral pinkish lavender, front broadly blue, and dashes of blue on last rays. Pectoral rays lemon yellow, membranes hyaline; bar of green at base. Teeth pale purplish. Iris golden and green.

5317. Same locality. April 4, 1908. Length, 332 mm. General color, back anteriorly green; posteriorly same, scales broadly edged with claret; top of head smoky in front of eyes, nose and chin blue; upper lip pale lavender; broad smoky stripe from eye to tip of opercle, below from corner of mouth stripe of green, center pale on opercle; lower cheek smoky; throat and breast bluish, continuing posteriorly; teeth pale rosy; front and tip of dorsal blue, main portion smoky, with greenish central bar; caudal blue or green; anal green terminally, smoky purple basally; green under scales. Ventral pale green or blue. Pectoral same, with smoky purple stripe in upper half. Iris golden.

5321. Same data. Teeth rosy. Blue of snout and chin broader.

7572. Endeavor Strait, Malampaya Sound, Palawan Island. December 23, 1908. Length, 285 mm. Teeth white; nose and chin bluish green; green stripe extending backward under eye and across opercle; slaty above and creamy below on opercle.

6221 and 6222. Galera Bay. April 9, 1908. Length, 263 to 290 mm. White teeth; pale orange upper lip; bright blue snout and chin; throat blue; back anteriorly bright green, posteriorly with purplish margin to scales; smoky purple streak behind eye; orange on opercle, in middle with green. Dorsal with edge and front blue, center green, purplish orange above and below, green basally.

4938. Iloilo market. March 29, 1909. Length, 263 mm. Nuchal region and anterior dorsal region emerald green; posteriorly bluish and purplish clouding, becoming deep emerald on caudal base; below top of pectoral, running to breast and belly area of heliotrope purple, same color bounding scales of posterior half of body; top of head before middle of eyes smoky purple; nose beryl blue; purple continued as a margin around upper lip; chin and lower lip beryl; greenish stripe under eye running backward to opposite upper base of pectoral, dull chrome blotch in hinder part; cheek and lower head purple to lilac, separated from blue of chin by continuation of subocular green stripe. Dorsal green; front and margin with broad blue band, beneath and above base double band of light purple. Caudal bright emerald green, edges and tip bluish. Anal bright green, front and margin blue and purple line at base. Ventral bluish, with green shades. Pectoral greenish blue, the middle covered with dark heliotrope stripe. Teeth white. Purplish stripe from posterior edge of eye to tip of opercle.

6358. Jamelo Bay. July 13, 1908. Length, 290 mm. Viridian, dusky posteriorly; front of head bluish green; top of head and stripe behind eye more olive; purplish stripe through middle of pectoral, dusky orange band through center; dusky orange at anal base; teeth white.

4852. Jolo market. February 12, 1908. Length, 235 mm.

8999. Langao Point, Luzon. June 24, 1909. Length, 250 mm.

8311. Lode Bay, Destacado Island. March 13, 1909. Length, 273 mm. General color green; lips blue; teeth white; blue of lips extending brokenly into subopercle and breast; broad green stripe with darker upper margin extends from corner of mouth, under eye and into angle of opercle; dark chocolate stripe extends above from eye to angle of opercle; cheek light violet; snout, far back as between eyes, smoky purple; most of body scales with red margins. Dorsal with blue margin, green central stripe above and below red or violet. Caudal green, darker on upper and lower margins. Anal with blue margin, red at base, remainder green. Pectoral with smoky purple stripe covering four of central rays; green stripe from corner of mouth under eye becomes yellowish toward angle of opercle.

6145 and 6146. Mansalay, Mindoro. June 4, 1908. Length, 260 to 273 mm.

6534. Maricaban Island. July 21, 1908. Length, 205 mm. Teeth white; upper lip narrowly red; nose, lower lip, and chin blue; from corner of mouth to eye greenish; greenish bar from eye toward base of pectoral, center yellow; dorsal similar to adjacent body, with orange central bar split posteriorly by greenish; caudal and distal three-fifths of anal bright green; body anteriorly green, posteriorly modified by reddish base and margin of scales; pectoral greenish with purplish center; ventral green.

5564. Masbate Reef. April 20, 1908. Length, 232 mm.

18612. Mompog Island. March 3, 1909. Length, 195 mm.

7957. Pagapas Bay, Luzon. February 20, 1909. Length, 280 mm. General color blue, posterior half to caudal tip green, smoky above. Top of head from above middle of eye to above mouth corner smoky brown. Teeth white. Lips and chin blue. Irregular bar of smoky brown from eye to above pectorals. Caudal greenish, with few dusky lavender spots at base. Most of terminal part of anal green, with lilac band above green base. Ventral green at base.

5882. Polloc. May 22, 1908. Length, 250 mm. Snout to chin bluish green, upper lip narrowly orange; green of chin extends under eye obliquely across opercle under slaty purple bar. Teeth whitish.

8179. Port Busin, Burias Island. March 7, 1909. Length, 235 mm. (Preopercle scales 2—2.)

11015 and 11035. Port Maricaban. July 21, 1908. Length, 178 to 190 mm.

7252. Port Matalvi. November 23, 1908. Length, 208 mm. Teeth white. Snout and chin blue. Top of head slaty and stripe through eye to point of opercle. Dorsal edge blue, body of fin purplish and blue green central bar.

7276. Same data. Length, 260 mm. Teeth white. Snout and chin blue or green, top of head and bar through eye smoky purple. Dorsal with blue edge and purple body, with green central bar, base blue. Pectoral green, purple stripe through center.

5797. Pujada Bay. May 15, 1908. Length, 250 mm. Teeth white; upper lip ochraceous, continuing into slaty forehead above green preorbital bar; tip of snout greenish blue; chin, throat and front of interopercle bright blue; dash of ochraceous below corner of mouth; preorbital bar continued posteriorly across opercle; broad postorbital bar above to tip of opercle; cheeks olivaceous gray with dull yellowish shades; occipital region and back green; sides green with margins of scales dull reddish; smaller specimens with much yellowish wash obliterating green; about 5 obscure dark saddles under dorsal and on caudal peduncle; dorsal front and edge blue; body of fin purplish with green central bar; caudal greenish blue, centrally with more or less orange on membranes; anal front and distal half greenish blue, base purplish; ventral blue; pectoral blue, with purplish central area, sometimes rather yellowish; in larger specimens an area from above eyes to above tip of pectoral extended uniform greenish blue; margins of scales posteriorly pale reddish, base with vertical bar, giving scales entire outline of about heliotrope. Postorbital green bar with orange blotches and spot of green just behind eye in purplish postorbital bar.

4889. Ragay River, in fresh water. March 10, 1909. Length, 253 mm

5275. Romblon. March 25, 1908. Length, 218 mm. Back anteriorly and nape emerald green, more dusky posteriorly, scales margined with purplish claret; purplish below; nose and chin bright beryl blue; between nose and middle of interorbital region from lower edge of eye slaty purple; similar bar from behind eye to opercle, below bright green stripe; cheek below dull purplish and orange; upper lip narrowly pink; teeth white. Dorsal margined by line of green, central portion occupied by 2 purplish bars and a bluish bar between. Caudal dusky grass green with dashes of dull purplish, bluish at tips of rays.

Anal grass green distally, bluish at margin, bar of dull purplish at base, front portion bluish, remainder hyaline with greenish wash. Pectoral bluish green above, lower membranes hyaline, rays greenish, medially dusky purplish. Iris golden.

7296, 7299, 7300. Sablayan, Mindoro. December 12, 1908. Length, 190 to 280 mm. Teeth white; orange on opercle; forehead slaty, with stripe of same behind eye; dorsal front and margin blue, base green; body dull orange, with green central bar; anal mostly green, purplish bar at base.

5682 and 5683. Santa Cruz. April 24, 1908. June 10, 1909. Length, 250 to 279 mm. Anterior back beryl; area above and in front of eyes slaty purple; upper lip narrowly purplish, snout and chin bright greenish blue; cheek bronzy; emerald band under eye downward toward base of pectoral; purplish line obliquely downward behind eye; pectoral with stripe of royal purple; other colors the same as in the specimen from Burias Island; teeth white.

5706 and 5709. Surigao, Mindanao. May 8, 1909. Length, 225 to 230 mm.

7351. Tara Island. December 14, 1908. Length, 202 mm.

6413 and 6420. Tilig, Lubang. July 14, 1908. Length, 212 to 278 mm.

7670. Ulugan Bay, Palawan Island. December 28, 1908. Length, 280 mm. Teeth white. Slaty streake, behind eye.

6646. Varadero Bay. July 23, 1908. Length, 308 mm. General color, blue green. Teeth white. Lips, snout, and chin brilliant blue; greenish bar across preorbital, curves down under eye to pectoral base, under portion divided by white blotch; from eye to front of opercle slaty bar. Dorsal blue, crossed by two dull blue purplish bands. Anal with terminal half green, base blue, median band slaty purple. Caudal bright green, without bars. Pectoral with medial purple stripe.

7158. West Coast of Palaui Island. November 18, 1908. Length, 275 mm. Forehead and front of back bluish green, posteriorly green with brown and purplish bases of scales giving darker tinge. Interorbital and part of snout smoky purplish, extending through eyes as oblique bar to opercle point. Snout and chin light blue; upper lip very narrowly dull orange; cheek olivaceous and dash of orange behind on lower opercle, separated from purlish bar by green which continuous from blue of cheek under eye; throat and ventral surfaces bluish. Dorsal with front and edge bluish, base like body scales, anterior portion purplish orange with green median bar, broken posteriorly. Caudal bluish green, few median purplish spots. Terminal three-fifths of anal bluish green, fin purplish medially, base blue green. Pectoral blue green, with central purple bar. Ventral pale blue green. Teeth white.

51745. U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. Type of *Callyodon fumifrons*.

CALLYODON FASCIATUS (Valenciennes)

Scarus fasciatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 222. Moluccas.

Scarus rivulatus (not Forskål) (Kuhl and Van Hasselt) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 223. Java.

Pseudoscarus rivulatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 44, pl. 9, fig. 3 (Java, Bawean, Singapore, Biliton, Celebes, Sumbawa, Batjan, Timor).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 34 (Java).—Alleyne and Macleay, Proc. Linn. Soc. N. S. Wales, vol. 1, 1876, p. 345 (Cape Grenville).—Day, Fishes of India, pt. 3, 1877, p. 413, pl. 87, fig. 6 (Madras).—Károli, Termesz. Füzetek, Budapest. vol. 5, 1881, p. 175 (Singapore).—Day, Fauna British India, vol. 2, 1889, p. 426.

Callyodon rivulatus Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 246 (Zamboanga).

Scarus russelii Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 234. (On Russell, Fishes of Cormandel, vol. 2, 1803, p. 14, pl. 119. Vizagapatam.)

Scarus rivulatoides Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 55. Batavia.

Scarus micrognathos Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 56. Batavia.

Depth 2⅖ to 2⅗; head 2⅞ to 3, width 2⅛ to 2⅕. Snout 2⅛ to 2¼; eye 7⅛ to 9, 3 to 4 in snout, 2⅓ to 3 in interorbital; mouth cleft 3⅘ to 4⅙ in head; lips largely or quite cover teeth; canines usually present, 1 to 3 each side above, same below; interorbital convex, 2⅘ to 3 in head. Gill rakers 16+12, short, weak, flexible.

Scales in lateral line 19 or 20, 5 or 6+2; 2 scales above lateral line, 6 below, 6 predorsal; cheek with 3 rows of scales, of which lowest row of 2 scales on preopercle flange. Scales with 40 to 48 basal radiating striae, apical 46 to 48; circuli fine.

D. IX, 10, 1, ninth spine 2⅘ to 3 in head, first ray 2¾ to 3½; A. III, 9, 1, third spine 3⅗ to 3⅞, first ray 2⅘ to 3⅙; caudal 1⅖ to 1½, little concave behind; least depth of caudal peduncle 2⅕ to 2⅖; pectoral 1⅓ to 1½; ventral 2 to 2⅓.

Body dull brown generally. Eye and mouth with a number of radiating variable greenish yellow lines, often more or less vermiculating and extending across chin and snout as well. Dorsals grayish brown, with marginal band of light olive and basal dark longitudinal band. Anals gray brown, margin rather broadly pale. Pectoral dull brown, with submarginal darker brown band above. Fins otherwise dull brown.

India, East Indies, Philippines, and Polynesia. We have followed Day in placing *Scarus russelii* Valenciennes, *S. rivulatoides* Bleeker and *S. micrognathos* Bleeker as synonyms.

Pseudoscarus flavolineatus Alleyne and Macleay may be the present species.[25]

6494. Balikias Bay. July 17, 1908. Length, 325 mm. (Canines, upper, 2—2; lower, 2—2.) Teeth white. General color, green. Lower opercle with orange shades; snout green, with geranium spots and lines; chin bluish, with broad heliotrope bands. Vertical fins edged blue, body of fin purplish orange; center of membranes largely green in dorsal; body of anal slaty purplish; caudal with dusky orange stripe.

8624. Biri Channel. June 1, 1909. Length, 226 mm.

8649. Same locality. June 22, 1909. Length, 243 mm.

7449. Bolalo Bay, Palawan Island. December 21, 1908. Teeth white; general color viridian green; nose and chin with orange or scarlet vermiculation; front and margin of dorsal and anal blue; body of dorsal orange, with round green blotches in center of membranes, fusing in front; caudal orange and blue; anal and dorsal with green at bases of rays and on membranes poste-

[25] Proc. Linn. Soc. New South Wales, vol. 1, 1877, p. 346, pl. 16, fig. 3. Cape Grenville.

riorly; body of anal lilac orange; ventrals pale orange, with blue fronts; pectorals grass green, with dull orange half stripe in upper portion at base.

8361. Buang Bay, Talajit Island. March 15, 1909. Length, 318 mm. (Canines, upper, 2—2; lower, 2—1.)

7811. Bugsuk Island. January 5, 1909. Length, 335 mm. (Canines, upper, 2—2; lower, 2—2.) Teeth dusky rose; front of head with orange brown merging into purplish olive on top, much vermiculated with broad green lines; ground color green; base of each scale with umber brown vertical bar or blotch; front and margin of dorsal blue, body orange, base with bluish or greenish blotches on rays, through center of orange body large green blotches, fusing more or less anteriorly; caudal blue, with orange blotches and stripes; front and margin of anal blue, body olive yellow, green at bases of rays; pectoral apple green, short half stripe of brown at base.

9140. Cabugan, Chico Island. July 30, 1909. Length, 290 mm. (Canines, upper, 2—2; lower, 2—2.)

7861. Cagayan, Sulu. January 8, 1908. Length, 296 mm. Teeth white; front of head vermiculated green and red; lower portion of opercle and hinder part of cheek with pale orange shades.

8289. Canmahala Bay, Luzon. March 11, 1909. Length, 270 mm. (Canines, upper, 2—2; lower, 0—0.)

8020. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 220 mm. Teeth white; snout and lower head orange, with very coarse bright green rivulations and small spots; general color green, becoming pale below, with yellowish or orange wash on breast and belly; scales of side and posteriorly with reddish border. Front and edge of dorsal and anal blue, with blue or green spots at bases of rays; middle body of fin orange; dorsal with central green band, which interrupted to cover only membranes posteriorly. Caudal orange, edges of lobes blue and blue streaks and spots throughout body. Ventral front blue, pale orange otherwise. Pectoral yellowish green, brownish red stripe through upper half, narrow, somewhat broken.

A. 8126. Dasol Bay. May 9, 1909. Length, 262 mm. (Canines, upper, 1—2; lower, 2—1.)

7574 and 7577. Endeavor Strait, Malampaya Sound, Palawan Island. December 23, 1908. Length, 219 to 280 mm. (7574, canines, upper, 2—2; lower, 0—0; 7577, canines, upper, 1—1; lower, 2—0.) Teeth white; head green and red; dorsal front and margin blue, body orange, large green blotches in membranes and greenish at base.

4578. Grande Island Reef, Subig Bay. January 8, 1908. Length, 245 mm. (Canines, upper, 1—1; lower, 0—0.)

6355. Jamelo Bay, July 13, 1908. Length, 295 mm. (Canines, upper, 2—1; lower, 2—2.) Teeth white. General color green, with red bar at base of each scale, under surface paler. Front of head orange or scarlet, with vermiculating green lines; top of head olive; green lines radiate about eye; opercle orange, with green submarginal stripe below. Dorsal front and edge blue, base green, body of fin with rhomboidal orange shades, green area on each membrane. Front and edge of anal blue, body of fin dusky purplish, bases of rays and all of last one green. Caudal dusky orange, with blue and green stripes and dashes. Pectoral grass green, upper edge blue, purplish stripes in upper half. Ventral with salmon shades, front blue.

4808. Jolo market, Jolo. February 8, 1908. Length, 345 mm. (Canines, upper, 2—2; lower, 3—2.)

4850. Jolo market. February 12, 1908. Length, 305 mm. (Canines, upper, 4—5; lower, 5—2; abnormal.)

7176. Jolo. March 7, 1908. Length, 325 mm. (Canines, upper, 2—2; lower, 1—2.) Brilliant emerald green, each scale with reddish base posteriorly. Lips greenish or blue, specked with red; chin to snout green, crossed by geranium red lines above, those below with purplish shade from blues of chin; posterior cheek and lower opercle with orange shades. Dorsal claret green, orange blue from base outward. Front and tips of anal rays blue, basal three-fourths bluish lilac. Caudal olive, dashed with green and orange. Pectoral grass green, narrow purple stripe in upper half. Ventral with front pale blue.

5729. La Generale Island, Capunuypugan. May 9, 1908. Length, 275 mm. (Canines, upper, 2—2; lower, 1—0.)

5730, 5731. La Grande Island, Capunuypugan. May 9, 1908. Length, 295 to 319 mm. (5730, canines, upper, 2—2; lower, 0—0; 5731, canines, upper, 1—2; lower, 1—1.)

8759. Lahuy Island. June 11, 1909. Length, 288 mm. (Canines, upper, 2—2; lower, 1—1.)

9003. Langao Point, Luzon. June 24, 1909. Length, 253 mm.

4660. Limbones Cove. January 14, 1908. Length, 295 mm.

8307. Lode Bay, Destacado Island. March 13, 1909. Length, 250 mm. General color greenish; smoky brown on head; snout and chin scarlet, with irregular greenish lines and spots; markings extend below and behind eye; lips green; teeth white; isthmus green; opercle probably rosaceous. Dorsal with blue margin, center of fin with green line through spinous portion, breaking up into large green spots on membranes of rayed portion, base reddish. Upper and lower margins of caudal blue, with irregular bluish dots near posterior margin. Anal with broad blue margin, base green, remainder of fin dusky lavender; base of each basal scale red. Pectoral with first ray green, region including second and third rays red, remainder of fin yellowish green, hyaline at margin. First ventral spine green, extending to outer part of first two rays.

8438. Mactan Island, Cebu. March 25, 1909. Length, 221 mm. (Canines, upper, 2—0; lower, 0—0.)

5402. Mactan Reef. April 6, 1908. Length, 240 mm. (Canines, upper, 1—1; lower, 1—0.) Body bluish green, bases of scales reddish geranium; slaty shades on breast and belly; top of head with olive shades; nose with vermiculating lines of green on scarlet ground; lips bluish green, a scarlet band behind upper; reddish band on chin; middle line on throat green; blotches and stripe of green on interopercular region, ground becoming orange on lower cheek and under opercle; lower hinder edge of opercle pink, submarginally green. Front and tip of dorsal china blue, base purplish, center broadly green with orange between and blue running down on rays somewhat. Front and tip of anal china blue, base green, center of fin purplish. Edges and tips of caudal china blue, membranes on central portion of fin green proximally and orange distally, lavender purple at center of rays and base of fin. Front of ventral blue, and blue line on last ray, orange centrally. Pectoral grass green, edge of upper ray china blue with purplish stripe below. Iris golden.

8844. Maculabo Island. June 14, 1909. Length, 295 mm. (Canines, upper, 1—2; lower, 0—2.)

34. Malapascua. March 16, 1909. Length, 208 mm. (Canines, upper, 1—1; lower, 0—0.)

6147 and 6148. Mansalay. June 4, 1908. Length, 242 to 300 mm. (6147, canines, upper, 2—2; lower, 1—1.) Scarlet and green vermiculations on snout, greens bluish below; side of head with reddish shades, becoming bright reddish orange in lower portion of opercle; general colors green with heliotrope edges to scales; teeth, white. (6148, canines, upper, 3—2; lower, 2—1.) Lips very narrowly orange; snout and front of cheek green; blue lines and spots

on lower head on red ground; upper anterior part of body green, scales with brownish or red margins; lower anterior and middle of body mostly red; teeth white.

6242. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 240 mm. (Canines, upper, 1—1; lower, 0—0.)

7598. Pancol, Malampaya Sound, Palawan. December 25, 1908. Length, 263 mm.

5912 to 5915. Parang, Mindanao. May 23, 1908. Length, 240 to 287 mm. (5912, canines, upper, 1—0; lower, 1—0.) Teeth almost entirely covered by lips. Green stripes on snout narrow; green lower lip without red. Reddish stripe in pectoral not extending to tip of fin. (5913, canines, upper, 2—2; lower, 0—0.) General color viridian, bases of scales with geranium red bars. Top of head olive. Interorbital and snout vermiculated and spotted with green. Ground color of snout and side of head more or less orange, becoming geranium below. Upper lip bluish green, with occasional orange spot; lower lip blue, with red median spot. Throat line blue. Green band in front of interopercle, another behind turning brown violet below. Side of head more or less dashed and spotted with green. Lower edge of gill cover reddish. Front of dorsal and edge indigo, body of fin reddish orange, becoming purplish below and posteriorly, median band green and breaking into spots on soft portion, base green. Caudal dull purplish orange terminally, edges of lobes and tips of rays with blue. Front and margin of anal blue, body lilac, base with green. Pectoral green, stripe of reddish in upper half. Front of ventral blue, rest of fin pale. (5914) Similar. Teeth white, like above. Green lines of front of head without definite pattern. (5915, canines, upper, 2—2; lower, 1—2.)

1 example, Philippines. Length, 298 mm. (Canines, upper, 0—0; lower, 1—0.)

8177. Port Busin, Burias Island. March 7, 1909. Length, 305 mm. (Canines, upper, 2—2; lower, 1—0.)

5748 and 5749. Port Capunuypugan, Mindanao. May 10, 1908. Length, 300 to 315 mm. (Canines, upper, 2—2; lower, 1—1.)

7107 and 7108. Port San Pio Quinto. November 11, 1908. Length, 318 to 349 mm. (7107, canines, upper, 2—2; lower, 1—0.) Green, scale bases red. Teeth white. Side of head below eye orange, about snout and chin with blue green network of lines. Dorsal edge orange blue, green streaks on membranes. Anal lilac, edges blue. Caudal blue and lilac, greenish near base.

7401. Port Uson, west of Pinas Island. December 17, 1908. Length, 287 mm. (Canines, upper, 2—2; lower, 2—2.) Teeth pale rosy; dull orange shades on lower opercle; front of head geranium with vermiculating green lines. Dorsal with blue front and margin, body ranging from purplish below to orange above, roundish green areas in center of each membrane fusing anteriorly, green blotch at base of each spine and ray. Caudal blue, rays with orange shades in middle of fin, dash of blue at tip of each lobe; orange extends on to membranes terminally, bright green basally. Anal front and margin blue, purplish on body with green at base. Ventral with blue front. Pectoral yellowish green, bronzy stripe through upper half two-thirds from base.

10744. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 218 mm.

8906. Rosa Island, Lagonoy Gulf. June 17, 1909. Length, 343 mm. (Canines, upper, 2—2; lower, 2—2.)

5281. Romblon. March 25, 1908. Length, 220 mm. Emerald green, scales with geranium red vertical bar at bases, becoming dusky and obscure anteriorly; top of head olivaceous; front portion of interorbital region almost without lines; between eyes green lines and spots and nose with finely vermiculating green lines of orange red continued on preorbitals; lips bluish with central dash of orange; chin band dull orange red with blue spot in center, behind greenish

band continuing posteriorly along median line of throat; lower head washed with orange; few small green blotches below cheek; teeth white. Front and margin of dorsal blue, central portion of each membrane with large rhomboidal area of bright green surrounded by narrow margin of dull geranium red, vertical portion lying along ray. Caudal blue terminally, green basally, mottled with dull red; edges of lobes blue. Front and margin of anal blue, dashes of same on bases of membranes and last ray, body of fin dull purplish. Ventral pale yellowish orange, front blue, pectoral grass green, terminally hyaline, stripe of purplish through upper portion and covering base. Iris dusky golden.

7851. Taganak Island, Balabac. January 7, 1909. Length, 240 mm. (Canines, upper, 2—2; lower, 1—1.)

6421. Tilig, Lubang. July 14, 1908. Length, 230 mm.

6472. Tilig Bay. July 15, 1908. Length, 295 mm. (Canines, upper, 2—1; lower, 0—0.) White teeth; general color green, with red bars on scales; front of head vermiculated with scarlet or orange and blue; lower opercle with orange shades; dorsal and anal margined with blue; dorsal body orange, with rhomboidal green blotches on membranes; caudal orange, striped with blue or green brokenly; body of anal more or less dusky; pectoral with purplish strips.

5016. Tumindao, lagoon anchorage. February 26, 1908. Length, 240 mm. (Canines, upper, 2—1; lower, 0—0.)

7156. West Coast of Palaui Island. November 18, 1908. Length, 326 mm. (Canines, upper, 2—2; lower, 0—1.) General color green, posterior scales with broad reddish bars at bases; breast with brassy overshades. Snout and side of lower part of head orange, brightest near opercle tip and snout; from eye forward much vermiculated with bluish green, throat lined with same. Teeth white. Edges of dorsal, anal and caudal blue; body of dorsal orange becoming broadly purplish, central area green breaking into rhombs in membranes posteriorly. Caudal rays with dashes of blue at tips, dull purplish stripes much broken by green blotches on basal part of fin. Body of anal smoky purplish, with blue blotches at bases of rays. Pectorals yellowish green, first rays somewhat blue, bronzy purplish irregular stripes through upper portion. Front of ventral pale blue, rest of fin ochraceous yellow.

56226 U.S.N.M. Bulan. Philippine Commission. 1 example. Length, 110 mm.

58028 U.S.N.M. Zamboanga. Dr. E. A. Mearns. 1 example. Length, 138 mm.

72720 U.S.N.M. Java. Messrs. Bryant and Palmer. 1 example. Length, 113 mm.

CALLYODON KELLOGGI Jordan and Seale

Callyodon kelloggi Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 327, fig. 62. Apia, Samoa.

Depth 2¼ to 2⅔; head 2⅔ to 2¾, width 2 to 2$\frac{1}{10}$. Snout 2⅔ to 2⅔; eye 6 to 7⅖, 2⅔ to 3 in snout, 2¼ to 2¾ in interorbital; mouth cleft 4⅔ to 5 in head; lips cover ⅔ of teeth; canines moderate, not conspicuous, 1 or 2 above each side, also below; interorbital 2⅗ to 2⅔ in head, convexly elevated and with prominent hump above small nostrils in adult, less so in smaller example. Gill rakers 20+21, short, slender, rather firm.

Scales in lateral line 17+5+2; 2 scales above lateral line, 6 below, 5 or 6 predorsal; cheek with 3 rows of scales, of which lowest row as 2 scales on preopercle flange. Scales with 33 to 40 basal radiating striae, apical 20 to 24; circuli very fine.

D. IX, 10, 1, ninth spine 3 to 3¾ in head, first ray 2⅗ to 3$\frac{1}{10}$; A. III, 9, 1, third spine 3¼ to 4¾, first ray 2⅗ to 3¾; caudal 1 to 1⅕, deeply emarginate, ends exserted; least depth of caudal peduncle 2 to 2⅙; pectoral 1⅛ to 1⅖; ventral 1¾ to 2⅛.

Brown generally, in small examples often tinged with olive. Small examples with front largely yellowish, which tint extends all around eyes. Edges of lips whitish narrowly, with submarginal yellow band around each. Another broad band across chin and still below yellow blotch each side, sometimes joined with band and variable. Vertical fins yellowish. Dorsals with submarginal gray longitudinal band, median gray longitudinal band on anal and each caudal lobe with median gray streak. In large examples these markings less distinct. Pectoral yellowish, with upper median or longest rays grayish, dusky terminally. Ventral yellow, with median longitudinal gray band.

Previously only known from Samoa. Below is a list of Philippine specimens we refer to the present species with certainty. Possibly it is the same as *Scarus gibbus* Rüppell,[26] apparently differing only in color. According to Rüppell the color is dark violet. Upper lip, ring around eye, lower half of opercle and throat greenish blue and two carmine red spots on the throat. Dorsal and anal reddish brown with sky blue edges, grass green streak along the middle. Caudal and pectoral greenish violet, upper edge of latter sky blue. Iris reddish yellow.

Klunzinger suggests that *Scarus microrhinos* Bleeker is the same as the present species, but Bleeker's fish has three rows of scales on the cheek and none on the preopercle flange.

8652. Biri Channel, Balicuatro Island. June 2, 1909. Length, 221 mm. (Canines, upper, 1—1; lower, 1—1.) Body beryl to verdigris; margins of scales heliotrope purple or magenta; breast and belly more bluish than side, central row of peduncular scales very bright green; nose and top of head emerald or somewhat more yellowish, side of head behind eye, cheek, and body above first fourth of pectoral washed with sulphur; teeth white; lower lip bluish, chin broadly orange, blue band across middle merging into green behind corner of mouth; round green spot at front of preopercle; median line on throat of blue, not extending to breast. Dorsal and anal front and margin, edges of caudal lobes paris blue; basal half of dorsal and two-fifths of anal verdigris; above bar of magenta or purplish about breadth of pupil, beginning at base of first dorsal membrane arching upward and at base of second and third anal rays; middle of caudal lobes with purplish stripe about equal in breadth to blue border, slightly blue beneath, center of fin bright green. Ventrals blue, somewhat greenish hehind, with broad dusky purplish stripe through center. Pectorals green, broad purple stripe through upper half beginning slightly terminal to base of rays and becoming brown in outer two-fifths. Last four abdominal scales with blue spot in each, forming median stripe.

7128. Inamucan Bay, Mindanao. August 8, 1909. Length, 230 mm. (Canines, upper, 2—2; lower, 2—2.) Green, scales with lavender margins. Side of head yellowish, chin and throat with orange.

[26] Atlas Reise Nördl. Afr. Fische, 1825, p. 81, pl. 20, fig. 2. Mohila, Red Sea.

6080. Little Santa Cruz Island. May 28, 1908. Length, 145 mm. (Canines, upper, 0—0; lower, 1—2.)

19196. Maagnas, Lagonoy Gulf, Luzon. June 7, 1909. Length, 198 mm. (Canines, upper, 1—2; lower, 1—2.)

6188. Palag Bay vicinity, Luzon. June 16, 1909. Length, 163 mm. (Canines, upper, 1—2; lower, 1—1.)

12865, 12866, 13108. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 210 to 226 mm. (12865, canines, upper, 1—2; lower, 2—2; 12866, canines, upper, 1—1; lower, 1—1; 13108, canines, upper, 1—1; lower, 1—1.)

A.665 and A.666. Sitanki Reef, northwest of Tumindao Island. September 24, 1909. Length, 342 to 345 mm. (A.665, canines, upper, 2—2; lower, 1—2; A.666, canines, upper, 1—1; lower, 1—2.) Teeth white; lips blue, lower joining blue blotch with red center on chin, which in turn continues as throat and median ventral stripe; short orange bar just above upper lip, behind which green stripe running backward from corner of mouth under eye; pectoral with black purplish bar through upper central part, above blue; dorsal, anal, and caudal lobes blue; base of dorsal green, bright orange bar through its terminal half; center of caudal green, tipped in fork with orange, broad purple stripe through each lobe; anal similar to dorsal, colors less brilliant.

7166. West Coast of Palaui Island. November 18, 1908. Length, 203 mm. (Canines, upper, 1—2; lower, 1—1.) Teeth white. Body bluish green, with irregular red bars at bases of scales, lower surfaces becoming entirely covered with reddish shades except central blue stripe and two obscure stripes above on each side. Upper lip green, with orange edge, green extending back across preorbital, covering front of cheek. Lower head with blue stripes and dots. Fins margined blue; body of dorsal orange, with greenish spots through center. Body of anal lilac. Both dorsal and anal with few blue spots at bases of spines and rays. Caudal yellowish green terminally, purplish basally. Pectoral with purplish medial stripe. Ventral color of adjacent body, except blue front.

51746 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Type of *Callyodon kelloggi*.

CALLYODON FRENATUS (Lacépède)

Scarus frenatus Lacépède, Hist. Nat. Poiss., vol. 4, 1802, p. 313, pl. 1, fig. 2. Great Equinoxial Ocean (Indo-Pacific).—Jouan, Mem. Soc. Sci. Cherbourg, ser. 2, vol. 5, 1870, p. 106 (Seychelles).

Pseudoscarus frenatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 40, pl. 16, fig. 2 (Celebes).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 307 (Celebes, Louisades, New Pommerania).

Pseudoscarus fraenatus Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 37 (Mauritius).

Depth 2½ to 2⅗; head 2⅞ to 3⅓, width 1⅞ to 2⅛. Snout 2⅛ to 2¾; eye 5⅕ to 6½, 2 to 2⅘ in snout, 1¾ in interorbital; mouth cleft 4⅕ to 4½ in head; lips largely cover teeth; hind canines 0 to 3 each side above, 0 to 2 each side below; interorbital 2⅞ to 4⅔ in head, convex. Gill rakers 10? to 15+24 or 25, slender, short, weak filaments.

Scales in lateral line 16 or 17+4 to 8+2; 2 scales above lateral line, 6 or 7 below, 4 or 5 predorsal; 3 rows of scales on cheek, of which lowest row usually of 1 or 2 scales on preopercle flange, rarely absent. Scales with 22 to 44 basal radiating striae, apical 24 to 39; circuli fine.

D. IX or X, 10, 1, second spine 1⅘ to 1$\frac{9}{10}$ in head, ninth spine 2¼ to 3, first ray 2⅛ to 2⅞; A. III, 9, 1 or 10, 1, third spine 2⅘ to 3⅔, first ray 2¾ to 3; caudal 1$\frac{1}{10}$ to 1¼, emarginate, ends little exserted, hind edge little convex as expanded; least depth of caudal peduncle 2 to 2⅓; pectoral 1⅙ to 1⅖; ventral 1⅓ to 1⅗.

Head and anterior half of body deep brown, remaining half pale brown and in contrast. Broad yellow to greenish band includes upper lip and extends to and along lower eye edge, thence back until above pectoral origin. Lower lip and some spots on throat yellowish green, sometimes yellow line across chin. Sometimes obscure gray lines, more or less reticulate, across interorbital and from above upper edge of eye. Sometimes greenish yellow spot of small size at upper hind eye edge. Iris brownish. Dorsals brown to pale yellowish, basally neutral gray or broadly deep brown and submarginal narrower neutral gray or pale longitudinal band. Anals mauve or neutral gray over greater basal portion, outer margin broadly buff to dirty greenish. Caudal brown, hind edge broadly pale brown separated from rest of fin by deep brown submarginal parallel line; sometimes median upper and lower rays of each lobe with narrow buff longitudinal streak. Pectoral dull brown, small neutral gray to blackish spot at origin. Ventral dull brown to whitish.

Mauritius, Seychelles, East Indies, Melanesia. A strongly marked species, in preserved examples appears bicolored, and the color pattern subject to little variation.

8127 to 8129. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 232 to 238 mm. (8127, canines, upper, 1—1; lower, 1—1; 8128, canines, upper, 2—2; lower, 1—0; 8129, canines, upper, 2—1; lower, 1—1.) Top of head and anterior back viridian; interobital region much dashed and spotted with pale red; teeth white, lower lip bluish green, color of upper lip continuous with snout; narrow red or pink stripe from corner of mouth across preorbital to eye; chin purplish with dash of blue in center, continuous with blue throat line, which in turn continues backward to nose; upper portion of opercle and anterior and middle of side smoky purplish; centers of scales grayish, with dark venation when faded, changing to blue below on breast and belly; lower head lavender, with green band behind chin and dash of same on interopercle; behind eye yellowish green, broadening to reach from point of opercle downward to lower base of pectoral. Caudal bright bluish green, lower portion with lavender shades. Front and margin of dorsal china blue, below bright geranium bar beginning at base of first membrane, ending on penultimate ray, about half width of pupil; middle of fin green, changing to lemon yellow on posterior rays; bases of rays with a small black or greenish blotch, mostly under scales; above an irregular purplish bar, changing to geranium on front and extreme hinder portion. Caudal blue, with broad purplish stripes through lobes. Anal front and margin about two-fifths of fin, bright china blue; basal portion more purplish, blue at bases of rays. Ventrals blue, purplish streak on second membrane. Pectorals dusky brown, membranes hyaline, upper ray bluish, base green; green about pectoral base continuation of green area on opercle; continuous behind pectoral for one or two scales.

7954. Balayan Bay, Luzon Island. February 20, 1909. Length, 263 mm. (Canines, upper, 1—2; lower, 1—1.) Viridian band across nose, backward under eye to below band of opercle; head above olivaceous, fading to lavender, lavender below; anterior back with slaty purplish shades; posterior upper body brilliant viridian, stripe through middle of caudal peduncle somewhat wider than eye, green fading into lavender below; bright green stripe crosses lower lip, another band on chin behind, dash on each interopercle, otherwise of purple; blue stripe along throat and lower parts to nose running brokenly at base of anal fin and crosses lower caudal peduncle and lower edge of caudal. Dash of green in front of dorsal covering about three scales, body of fin reddish, front and margin blue; green band through center about breadth of pupil on first six spines, originates at root of second spine, rises to orange red inframarginal band and continues backward; on seventh spine broadens in front of spine; similarly on remaining spines and first four soft rays, after which it breaks into an oblong green blotch on membrane only; last half ray blue; dashes of blue on the bases of posterior rays. Upper edge and tip within fork of caudal blue, irregular semicircular band of blue changing to green in center, crosses fin behind lobes; ground outside and within reach of semicircular band purplish orange. Terminal two-fifths and most of front of anal blue; basal portion pale purplish or lavender, the base with blue and last half ray blue. Ventrals blue, with lavender through central portion; pectorals bright yellow, bluish green band at base, below on fleshy part lavender band, external surface of axil green. Teeth white.

8693. Batag Island. June 3, 1909. Length, 263 mm.

19186. Butauanan Island. June 12, 1909. Length, 203 mm. (Canines, upper, 0—1; lower, 0—0.)

11269. Biri Channel. June 1, 1909. Length, 222 mm.

8653 and 8654. Biri Channel. June 22, 1909. Length, 223 to 236 mm. (8654, canines, upper, 2—2; lower, 2—2.)

7453. Bolalo Bay, Palawan Island. December 21, 1908. Length, 262 mm. Teeth dusky rose; general color green; middle of side and back with distinct lilac overshades; top of head with many short irregular spots and lines of lilac; chin and lower edge of subopercle also lilac, lines of same radiating from the eye; one broken from eye to corner of mouth, and another broadening from eye to below base of pectoral. Dorsal with blue front and margin, bright orange brown inframarginal bar, lower half of central portion purplish, color narrowing and changing to orange both anteriorly and posteriorly, middle of fin green, becoming broad and yellowish posteriorly. Caudal purplish, edges of lobes blue, middle occupied by broad dark purplish stripe, central body of fin washed with black. Terminal portion of anal blue, basal with purplish shades. Ventrals blue, with dashes of pale lilac. Pectorals hyaline, rays dusky, upper ray narrowly blue.

8330. Buang Bay, Talajit Island. March 15, 1909. Length, 250 mm. (Canines, upper, 2—1; lower 0—1.) Teeth white; top of head and anterior back purplish olive, fading to pale purplish; posterior body viridian, rather than virdigris; yellow area on caudal peduncle. Front and margin of anal and dorsal usual blue; edges of caudal lobes same; body of dorsal orange, with median greenish area made up of blotches on central portions of membranes, these fusing on spinous region; origin of stripe at base of second spine, running diagonally to middle of third, thence backward through central portion of fin; posterior rays dull orange, breaking green band into blotches, lower orange portion of fin with purplish shades especially within center; pale portion of caudal bright orange with purplish shades at base, central area of fin yellowish green becoming blue in stripe running downward to inner edge of each lobe. Anal body dusky

purplish orange, base of fin blue. Blue stripe from throat continues on median ventral line to anus. Ventrals very pale purplish, fronts blue with blue dashes on posterior rays. Pectoral hyaline lemon yellow, color most pronounced on upper portion; bluish green bar at bases of rays; area on side under pectoral purplish. Lower head similar with greenish wash; subopercular stripe continued backward behind band of opercle on about three or four scales; bases of scales in central portion of green area with pale magenta bar; not appearing near dorsal base and fades into color of abdominal region below.

A. 579. Busbus Point, Siasi. September 20, 1909. Length, 248 mm. (Canines, upper, 3—1; lower, 1—1.)

10600 and 11140. Cabugan Island, Hinunangan Bay, Leyte Island. July 30, 1909. Length, 175 to 200 mm. (10,600, canines, upper, 0—1; lower, 0—0 [1766]; 11140, canines, upper, 1—2; lower, 0—0 [1765].) General color gray with more or less mottled effect on back and side from spots of pale olive gray; teeth white or very pale rosy. Dorsals body color with more or less olivaceous shade, fronts and margins narrowly slaty; apparently slight mottling similar to that on body, but no bars; caudal more or less marked with pale specks in some examples, slightly apparent at base in others; anals similar to body, margins pale slaty, sometimes distinctly mottled with paler and obscurely, not apparent in others; ventrals pale rose; pectorals slightly dusky, more or less olive shade above, somewhat rosy on fleshy base, and dusky spot on upper base; caudal in fork slightly whitish or hyaline at tip.

8021. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 265 mm. (Canines, upper, 1—1; lower, 1—2.) Teeth dusky white; head and caudal region green; body anteriorly more or less dusky or purplish; lips green, with purplish bar across chin interrupted on median line by green; throat green, continued as line across breast and belly; dash of green behind chin and longitudinal one on interopercle; interorbital region with small brownish spots; dashes of same color radiating from in front above and behind; broad green band from lower corner of eye to base of pectoral; nuchal region and including base of first five dorsal spines green. Front and margin of dorsal blue, under this orange stripe of equal width, body yellowish green, becoming clear yellow posteriorly; an arched bar of purplish covering base of fin, beginning about third membrane and crossing base of penultimate ray; last half ray green. Caudal with green edges, broad purplish stripe internal on lobes, central body smoky purplish green. Front and margin of anal green, including all of last half ray, basal portion purplish, occupying three-fourths of first ray, becoming narrower posteriorly except at last membrane where between vertical edge. Ventrals green, with dusky orange stripe. Pectorals hyaline yellow, base green, also first ray; black spot at upper base.

11791. Cebu market. March 20, 1909. Length, 223 mm. (Canines, upper, 0—1; lower, 2—2.)

5332. Cebu Market. April 4, 1908. Length, 210 mm. Slaty anteriorly; greenish posteriorly and below; teeth reddish; lips blue, upper broadly, continued as stripe through lower eye across opercle into side; chin pale with blue band behind continued mesially to vent, interrupted at ventral; dash of blue in front of interopercle, lower head otherwise as front of body. Front and tip of dorsal narrowly china blue, basally greenish, body orange with median interrupted greenish stripe. Caudal orange, edges of lobes blue, horseshoe of blue within fork. Anal broadly with front and edge blue, narrow on base and last ray, body of fin greenish orange. Front and last rays of ventral blue, centrally reddish or orange. Pectoral straw color, base with blue bar. Iris golden.

7547. Endeavor Strait, Malampaya Sound, Palawan Island. December 23, 1908. Length, 224 mm. (Canines, upper 2—2; lower, 1—1.) Teeth white. Green above, bluish below; slaty lines and spots pale lilac. Dorsal front and margin blue, inframarginal orange or geranium band, center of fin green, becoming yellow and broader behind; half bar of geranium near base, broken at the sixth spinous membrane. Caudal blue, dull purplish stripes on lobes. Anal margin blue, base somewhat lilac, with dash of blue in center of front, extending between third and about seventh or eighth rays; extreme base blue. Ventrals blue. Pectorals hyaline, upper ray green, base green, with black blotch above.

7609. Endeavor Strait. December 24, 1908. Length, 250 mm. (Canines, upper, 2—2; lower, 2—1.)

9093. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 253 mm. (Canines, upper, 2—2; lower, 1—1.)

A. 1349. Great Tobea Island. December 14, 1909. Length, 212 mm. (Canines upper, 1—1; lower, 1—1.)

9008. Langao Point, Luzon. June 24, 1909. Length, 240 mm. (Canines, upper, 1—0; lower, 1—0.)

9271. Murcielagos Bay. August 9, 1909. Length, 240 mm.

8227 and 8966. Murcielagos Bay, Mindanao. August 20, 1909. Length, 208 to 212 mm. [1815.] (8227, canines, upper, 1—1; lower, 1—0, 8966, canines, upper, 1—1; lower, 1—1.) Teeth white, lips bluish green, anterior portion of body above with reddish brown wash; nuchal region and posterior bright virdian; margins of dorsal, anal, and caudal lobes blue; inframarginal bar of scarlet on dorsal, similar but broader one at base, becoming purple at junction of soft and spinous fin, median bar of emerald and yellowish posteriorly; center of caudal purple, brown stripe through each lobe; base of anal purplish; fronts of ventrals blue; upper ray of pectoral narrowly blue, base green, fin dusky hyaline or very pale straw color.

9336. Murcielagos Bay, Mindanao. August 21, 1909. Two examples. Length, 220 mm. Anterior portion of body largely of drab or lilac shades, bluish below, little green at base of dorsal and green stripe on first three or four scales in front of dorsal; top of head similar, more or less olive overshade; snout and broad band crossing preorbital under eye backward to point of opercle of bright green; lower lip blue; teeth dusky white; green band behind chin and dash on interopercle; lower head otherwise with more or less reddish shades below; posterior body viridian, base of scales slightly reddish, distinct yellow area in middle of caudal peduncle; in one example shifted above middle and becomes more or less obscure; along base of anal and lower caudal peduncle lilac shades prominent; blue midventral stripe from chin to anus. Dorsal with blue front and margin, orange beneath, median green band begins on second membrane and not quite reaching last two; broad orange band beneath which largely purplish in middle region. Edges of caudal lobes bright blue, body of fin orange with blue and green crescent through middle connecting with body green by median stripe, this crescent green centrally, horns becoming blue. Anal with blue front and broad margin, also at base of last ray; basal half or three-fifths purplish orange. Ventral front blue with dash of same color on three hindmost rays, remainder of fin hyaline pink. Pectorals pale yellow, blue bar at base with reddish or purplish bar on fleshy part; green band from head continued on first two or three scales above base of pectoral.

18584. Same data. Length, 208 mm. (Canines, upper, 2—2; lower, 1—1.)

7969. Pagapas Bay. February 20, 1909. Length, 272 mm. (Canines, upper, 1—1; lower, 1—1.)

7958. Pagapas Bay. February 20, 1909. Length, 285 mm. (Canines, upper, 2—3; lower, 0—2.) General color green, with dusky yellow wash on side above pectoral. Lips green; chin with blue green stripe; blue line along isthmus continued to ventrals. Dorsal margin blue anteriorly, pale bluish green margin posteriorly, orange bar, smoky green bar, purple base, with respectively light green and pink on last four or five rays. Anal edge blue, base smoky purple. Ventrals bluish green and light smoky lavender.

7970. Same data. Length, 240 mm. (Canines, upper, 1—3; lower, 2—2.) General color green. Broad green bar from snout through and under lower part of eye, extending to pectoral base; lower lip with green edge; throat band green; membrane of isthmus green, extending as broken median ventral line to vent; green spot under cheek; body behind pectoral tip green with rosy base. Dorsal and anal edges and outer caudal edges of ventrals greenish blue like pectoral base; orange band submarginal on dorsal, below indistinct greenish area; lower part or subbasal region of dorsal and anal light purple, bases yellow. Elongated greenish yellow spot on caudal peduncle and another smaller spot on body just behind pectoral tip. Small blue green spot on each scale of lateral line. Dorsal with purple of lower part of fin giving place to orange over last six rays; last membranes of dorsal and anal bluish green. Central part of caudal edge light orange. Blue green on under edge of anal, broad basal part lavender, base blue green. Purple spot at upper axil of pectoral, base of fin greenish blue, first eight rays and membranes yellow, rest of fin hyaline.

A. 1359. Pendek Island. December 15, 1909. Length, 233 mm. (Canines, upper, 4—4; lower, 3—2.)

5885. Polloc. May 22, 1908. Length, 228 mm. General color green, reddish bars on scales posteriorly. Top of head and anteriorly body slaty above; green bar from tip of opercle, under eyes and across snout; lower head more or less smoky. Lower lip green; green band across chin; dashes of green on interopercle; median line on throat, breast and belly blue. Dorsal and anal edged blue, former with submarginal bar. Caudal orange, with crescent in fork and edges blue. Pectoral yellowish. Ventral bluish or green.

8189 and 8191. Port Busin, Burias Island. March 8, 1909. Length, 240 to 250 mm. (8189, canines, upper, 2—1; lower, 2—2; 8191, canines, upper, 2—1; lower, 1—2.)

18714. Port Dupon, Leyte Island. March 17, 1909. Length, 193 mm. (Canines, upper, 1—1; lower, 1—2.)

4606. Port Palapag, near northern Samar. June 3, 1909. Length, 183 mm. [1585.] (Preopercle scales 1—1.) General color green; scales with reddish margins, red becoming prominent color on upper posterior portion of body; teeth white; greens of head bright, top of head between eyes striped and specked with reddish; lower lip blue; a reddish band across chin and preorbital to eye, blue behind; blue median stripe from throat to anus; broad green band from eye across opercle to base of pectoral; borders of anal and dorsal blue, also edges of caudal and fronts of ventrals; dorsal body reddish orange, with broad green central band, latter becomes pale posteriorly and whole of last two or three rays somewhat orange; reddish stripe through each caudal lobe, base of central portion purplish, terminal portion green and red of lobes bordered by blue internally; basal three-fifths of anal reddish with row of diffused blue spots through centers, bases of last rays blue; pectorals hyaline pink, without stripes.

5802. Pujada Bay. May 15, 1908. Length, 218 mm. (Canines, upper, 2—2; lower, 1—2.) Anterior portion of body slaty, posterior bright green, scales with vertical geranium bar at base, in slaty portion becomes more heliotrope;

pale area on side of caudal peduncle; lower parts lavender; teeth white; nose bright green, continued as preorbital bar and passing under eye and across opercle to below point; blotch of green above and behind eye; lower lip bluish green; broad green bar across front of interopercle, meeting and passing back as throat line, continued as broad blue line mesially to front of anal. Dorsal front and margin blue, then orange, then lavender purple, hyaline orange posteriorly; a green bar under orange, broken into round spots posteriorly, green at base. Caudal purplish orange, edged with blue, interrupted blue crescent in fork. Anal blue terminally, lavender purple at base and blue blotches at base. Ventral blue, with reddish center. Pectoral yellow, with blue base. Iris golden.

8786. Quinalasag Island. June 21, 1909. Length, 225 mm. (Canines, upper, 2—0; lower, 0—0.)

13272 and 22208. Rapurapu Island. June 22, 1909. Length, 210 to 223 mm. (22208, canines, upper, 1—2; lower, 2—1.)

5297. Romblon. March 26, 1908. Length, 255 mm. Teeth white; nose bright emerald green, color continued as suborbital line across opercle; above head purplish slate; dash of green behind upper corner of eye and some greenish on nape in front of dorsal; dull heliotrope on either side of green suborbital line; lower lip green; chin dull lilac, green band behind; interopercular region lilac, with green spot on either side forward; cheek and interopercle backward soiled with purplish slate with some shades of green; color of top of head continued backward to near middle of body; posterior emerald green; all scales on side with reddish bar at base; lower parts merging into lilac; median line of blue from throat to vent, interrupted about ventrals. Dorsal front and margin china blue; under this band of dull reddish orange, base of fin bright purplish, centrally green in posterior portion; soft rays orange, except last half which is green; green blotches at the bases of the last five or six rays. Caudal edged with greenish blue on lobes, broadly orange in fork, dull reddish under green on edges of lobes continued to tips, where it becomes more orange; center of fin grass green basally, blue band between this and orange continued to tips of under part of lobes. Anal bright blue on front and distal two-fifths, lilac basally, last ray and narrowly along base bright blue. Pectoral pale yellow, with blue basal bar becomes greenish on inner part of axil; fleshy portion with dull purplish bar above, brownish below. Ventral with first ray and spine blue, last three rays blue, otherwise second ray dull lilac. Iris with metallic brassy.

6798. Sacol Island. September 9, 1909. Length, 243 mm. (Canines, upper, 2—2; lower, 1—2.) Teeth dusky white; broad green band across snout under eye back to point of opercle; lower lip narrowly green, green band behind chin; blue throat line running medially on ventral surface; anterior half of body, top of head predominately reddish, posteriorly green; short yellow band on middle of caudal peduncle. Front and margin of dorsal and anal and edges of caudal lobes blue; orange band under blue of dorsal beginning at base of first membrane; green central band beginning at base of second spine, more or less broken at transverse portion, beneath purple and orange, latter covering all of last four rays except blue spots on last half. Caudal orange with dashes and stripes of blue. Anal greenish orange basally on about two-thirds of fin. Ventral fronts blue, last two or three rays with dashes of blue, otherwise hyaline orange. Pectorals hyaline yellow, broad blue base, somewhat orange on fleshy base outside.

5685. Santa Cruz, Marinduque. April 24, 1908. Length, 250 mm. (Canines, upper, 1—0; lower, 1—2.)

17666. Sitanki reef. September 24, 1909. Length, 157 mm.

A. 473. Tulnnaluta Island. September 9, 1909. Length, 250 mm. (Canines, upper, 1—2; lower, 0—1.)

9432. Tulayan Island. September 13, 1909. Length, 200 mm. (Canines, upper, 0—0; lower, 1—1.)

7371. Tara Island. December 15, 1908. Length, 243 mm. General color green; side above pectoral with pink overshade, bases of scales posterior pink; nose bright green; bar from eye to base of pectoral bright green, above and below green areas more or less of lavender lilac overshade; interorbital area vermiculated with lilac on green ground; lower regions with blue shades; blue line through throat and breast and below. Blue front and margin of dorsal and at bases of rays, geranium pink bar above base and below blue margin, grass green bar through center expanding into yellow on last rays, including most their length. Caudal blue, with reddish stripe through each lobe. Front and margin of anal blue, base with reddish overshades. Ventrals blue. Pectoral rays very pale brownish hyaline, first ray blue above. Teeth dusky white.

7687. Ulugan Bay. December 29, 1908. Length, 270 mm. (Canines, upper, 3—3; lower, 1—2.)

7157. West coast of Palaui Island. November 18, 1908. Length, 222 mm. (Canines, upper, 1—0; lower, 1—1.)

8538. Wreck Bay, Dalaganem. April 8, 1909. Length, 248 mm. (Canines, upper, 2—2; lower, 2—1.)

A. 1258. Uki, Bouro Island. December 9, 1909. Length, 295 mm. (Canines, upper, 2—1; lower, 0—0, preopercle scales, 4—6.)

A. 1315. Tifu Bay, Bouro Island. December 10, 1909. Length, 218 mm.

9508. Dodepo and Pasejogo Islands, Gulf of Tomini, Celebes. November 16, 1909. Length, 193 mm. (Canines, upper, 1—2; lower, 1—1.)

12770. Limbe Strait, Celebes. November 10, 1909. Length, 210 mm. (Canines, upper, 2—2; lower, 1—0.)

22861. Togian Bay, Togian Island, Gulf of Tomini, Celebes. November 19, 1909. Length, 179 mm. (Canines, upper, 0—0; lower, 1—1.) [2053.] Anterior half of body purplish, posterior viridian; broad green bar across snout and upper lip, passes backward under eye to point of opercle, continuing above pectoral on three of four scales; lower lip narrowly blue; broader blue band across chin, becoming green in front of cheek; dash of blue shading into greenish wash posteriorly on lower naked portion of preopercle; broad blue median stripe, interrupted at base of ventrals, shows somewhat along base of anal; yellowish area through middle of caudal peduncle; front and margin of dorsal, anal, and edges of caudal lobes blue; base of dorsal purplish changing to vermilion on posterior rays, narrow inframarginal orange vermilion bar rises at base of first membrane, continues about equal width until last three or four rays where it fuses with lower color, separated by median green bar from purple; basal half of anal lilac purple or with orange shade; caudal orange, blue crescent through its center reaching to base of middle rays, where it becomes slightly greenish, equals in width blue edge of lobes; fronts of ventrals bright blue, with dashes of blue on last three rays terminally, rays otherwise dull orange; pectorals hyaline straw color, without color on lower rays, base bright green above purplish of fleshy part; along median ventral blue stripe wash of orange, fusing upward into the purplish ground color.

A. 1160, 13257, and 13258. Gane Road, Gillolo Island. December 1, 1909. Length, 202 to 230 mm. (A. 1160, canines, upper, 1—1; lower, 3—1; 13257, canines, upper, 0—0; lower, 2—2; 13258, canines, upper, 1—1; lower, 1—1.) Teeth dusky; yellow on caudal peduncle very small; broad green bar from snout under eye to point of opercle; lower lip bluish; blue median ventral bar; dorsal

blue, front and edge and narrow inframarginal bar of orange covering all of last rays, under this narrow bar of green, basal half of fin purplish; anal blue at margin, about 2/5 of fin, narrowly blue at base, basal 3/5 purplish, last ray blue; caudal distally orange, edges blue, irregular crescent with green at base; iris blue; ventrals blue in front and behind; pectorals hyaline straw color, blue at base.

CALLYODON JANTHOCHIR (Bleeker)

Scarus janthochir BLEEKER, Nat. Tijds. Ned. Indie, vol. 4, 1853, p. 139. Ternate, Batavia.

Pseudoscarus janthochir BLEEKER, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 30, pl. 5 (Java, Celebes, Ternate).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).

Pseudoscarus jantochir REGAN, Journ. Bombay Nat. Hist. Soc., vol. 16, pt. 2, 1906, p. 330 (Persian Gulf).

Pseudoscarus altipinnis STEINDACHNER, Denks. Akad. Wiss. Wien., vol. 41 (1), 1879, p. 18. Java, Celebes, Ternate, Kingsmills, Moluccas, New Ireland, Hawaiian Islands.—GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 326, pl. 160 (Yap, Ponape, Ruk, Hervey Islands, Pomotous).

Pseudoscarus godeffroyi GÜNTHER, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 326, pl. 159. Society Islands.

Depth 2⅓ to 2⅖; head 2⅗ to 3, width 2 1/10 to 2⅛. Snout 2⅛ to 2½; eye 7⅛ to 10⅓, 3⅙ to 7⅘ in snout, 2⅗ to 3⅘ in interorbital; mouth cleft 3⅞ to 4¾ in head; lips ⅓ to ½ cover teeth; canines 1 or 2 each side above and below, sometimes absent; interorbital 2½ to 3, convex. Gill rakers 15 to 20+28 to 32, short, weak, slender, flexible.

Scales in lateral line 17 to 20, 4 or 5 + 2 or 3; 1 or 2 scales above lateral line, 6 below, 5 to 7 predorsal; cheek with 3 rows of scales, of which lowest row of 2 or 3 scales on preopercle flange. Scales with 39 to 48 basal radiating striae, apical 36 to 64; circuli very fine.

D. IX, 10, 1, ninth spine 2¾ to 3⅛ in head, first ray 2⅘ to 3¾; A. III, 9, 1, third spine 3⅓ to 5¾, first ray 2⅗ to 4¼; caudal 1 1/10 to 1⅓, truncate behind, tips well exerted; least depth of caudal peduncle 2 to 2⅖; pectoral 1¼ to 1½; ventral 1¾ to 2⅛.

Burnt umber generally, scales above anal and on caudal peduncle each with median pale spot. Brownish line forward from eye close above nostrils and crossing snout. Buff band, narrow, from lower and lower front eye edge to upper lip, behind eye arching down toward pectoral origin, inclosing cheeks in large greenish yellow area. Iris brownish. Teeth green. Dorsals pale greenish, base of rayed fin deep neutral slate. Anal pale greenish, medianly with broad grayish band. Caudal pale greenish, median upper and lower rays grayish. Pectoral nearly seal brown, hind edge broadly pale. Ventral brown, front edge little darker.

Arabian Sea, East Indies and Polynesia to Paumotus. Both *Pseudoscarus altipinnis* and *P. godeffroyi* agree with certain of our examples in every way, and we are obliged to admit them as syno-

nyms. *Scarus xanthopleura* Bleeker seems to differ only in color. Its pectoral is shown with the upper border blue, with a submarginal yellow line, and the dorsal pink, with median row of blue blotches, smaller on the soft dorsal posteriorly.

8626. Biri Channel. June 1, 1909. Length, 368 mm. (Canines, upper, 0—1; lower, 0—0.)

8656. Biri Channel, Balicuatro Island. June 2, 1909. Length, 332 mm. (Canines, upper, 1—1; lower, 2—1.) Beryl to verdigris, scales of body broadly margined with pinkish, becoming somewhat heliotrope on back; breast with bluish shade; broad blue stripe median on throat, breast and belly; on either side of this pink; forehead washed with rosy purple, distinct green bar from front of one eye across most prominent part of forehead to its opposite; broader and more diffused bar from top of one eye to another; dash of green behind eye; lips bluish green, which joins at corner of mouth, forming green bar across preorbital, which curves backward under eye; narrow orange stripe across snout above upper lip separates green of lip from broader band above snout; small green crescent above in median line; blue of lower lip extending backward on chin mesially; orange band from blue obliquely upward almost to eye; greenish blue bar behind, then orange wash extending along margin of interopercle; large pale yellowish blotch in center of caudal peduncle; scales behind purplish, with green centers; front and margin of dorsal and anal paris blue; basal half of each fin verdigris; dull orange stripe somewhat broader than blue through outer half of fin; edges of lobes and center of caudal fin bright green, stripe through middle of each lobe purplish at base, becoming sort of olive yellow terminally, tip of fork of fin purplish; ventrals hyaline green, spine and tip of first ray blue; upper half of pectoral dull antwerp blue, oblique bar through middle of purplish running across base of rays from belly to about sixth ray above, thence obliquely outward to tip of fin, lower portion of fin terminally hyaline greenish and dash of orange in fleshy base; teeth white.

7859. Cagayan, Sulu. January 8, 1909. Length, 470 mm. (Canines, upper, 1—2; lower, 0—0.) Cheek and lower head bright emerald; top of head italian pink, fading into peach bloom; few specks of green on snout and one in front of eye. Body very dark bluish green; lower portions more or less tawny; dorsal front and margin leitch's blue, spines and rays green; membranes of spinous portion tawny, becoming slightly purplish on soft portion; green of rays extending over membranes in upper portion of soft fin, including all of last membrane; edges of caudal lobes blue, each lobe with broad tawny stripe through middle, broader than eye, central body of fin yellowish green and scales at base of fin carry small round green spots, one to three in each; anal bright green, becoming blue on extreme front and margin, irregular twany bar through center from base of second spine to tip of antepenultimate ray; ventrals green, fronts blue, tawny through middle; pectorals smoky purple, becoming more or less hyaline at tip below and green proximal. Iris green and golden. Teeth indigo, exposed portion of upper, except edge, with moss growing.

7727. Caxisigan Island, near Balabac. January 2, 1909. Length, 318 mm. (preopercle scales 2—1). Teeth dark green to indigo; lower lip, chin, snout and top of head reddish ochre, merging into olivaceous on top of head; bright green bar across snout, not reaching eye, but with spot or dash between its end and eye, markings limited by blackish borders; lower head brilliant green, partially set off from the upper color by blackish; breast more or less tawny; dorsal front and margin blue, front rays to about one-thirteenth green, first 9 or 10 membranes raw umber, nearly same as snout color; posterior portion

of dorsal at base dark purplish, distal portion including nearly all of last ray bright green, blue margin not touching last three rays; caudal with bluish green edges, broad umber stripe on each lobe, central body yellowish green, scaled region at base with purplish overshades each specked with broad green dot in centre and dots continuing more or less through caudal peduncle, but obscured by dark overshade; anal with bluish front and margin, base of last membrane and ray green, central body ocher with purplish shades anteriorly, with three or four round green spots in posterior portion of ocher; ventrals bluish green, some of rays, especially first, ochraceous; pectoral dark purple, upper upper ray with greenish shade; iris green and orange.

8544. Cuyo Harbor. April 9, 1909. Length, 300 mm.

9209. Mahinog, Camiguin Island. August 3, 1909. Length, 328 mm.

6137 and 6138. Mansalay, Mindoro. June 4, 1909. Length, 329 to 380 mm.

8691. Matnog Island. June 3, 1909. Length, 368 mm. (Canines, upper, 2—2; lower, 0—0.)

8892. Palag Bay vicinity, Luzon. June 16, 1909. Length, 482 mm. (Canines, upper, 2—2; lower, 0—0.)

603. Port Caltom. December 15, 1908. Length, 334 mm.

8966. Rapurapu Island and Strait. June 22, 1909. Length, 305 mm.

6940. Sabtan Island. November 8, 1908. Length, 600 mm. (Canines, upper, 2—2; lower, 0—0.) General color green, becoming somewhat brighter in alcohol; edges of scales brownish or tawny with more or less obscure central spots; lower head brilliant green, upper with tawny shades; lower lip and mouth corner dull orange; breast and belly with tawny shades; teeth dark green; dorsal green, membranes tawny, most distinct in spinous portion; distal half of anal green, basal half tawny with green blotches; edges of caudal lobes green, body of fin green, with broad tawny stripe in each lobe; pectoral greenish, with purplish overshades; ventral green, more or less tawny centrally; iris orange, green above.

CALLYODON CAUDOFASCIATUS (Günther)

Pseudoscarus caudofasciatus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 283. Mauritius; Fishes of Zanzibar, 1865, p. 108 (Zanzibar); Journ. Mus. Godeffroy, vol. 8 (15), 1909, p. 312, pl. 153, figs. *a–b* (Mauritius, Zanzibar, Ponape, Mortlock, Samoa).

Callyodon zonularis Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 321, fig. 60. Pago Pago, Samoa.—Seale and Bean, Proc. U. S. Nat. Mus., vol. 38, 1907, p. 246 (Zamboanga.)

Depth 2½ to 2⅞; head 2⅗ to 2⅞, width 2⅛ to 2⅔. Snout 2⅛ to 2½; eye 5⅛ to 7⅘, 2¼ to 3⅓ in snout, 1⅞ to 2¼ in interorbital; mouth cleft 3⅞ to 4¾ in head; lips half to largely or quite cover teeth; canines none; interorbital 3 to 3⅕, convex. Gill rakers 20+35, short, slender, flexible.

Scales in lateral line 17 to 19, 4 or 5+2; 2 scales above lateral line, 6 below, 5 or 6 predorsal; 2 or 3 rows of cheek scales, when latter prevail lowest row on preopercle flange of 3 or 4 scales. Scales with 35 to 46 basal radiating striae, apical 31 to 40; circuli very fine.

D. IX, 10, I, ninth spine 3½ to 3⅞ in head, first branched ray 2⅞ to 3¼; A. III, 9, I, third spine 3½ to 3⅞, first branched ray 3 to $3\frac{1}{10}$; caudal 1½ to 1⅗, emarginate, more deeply so with age and little double concave as expanded; least depth of caudal peduncle 2¼ to 2⅔; pectoral 1¼ to 1⅖; ventral 1¾ to 2⅕.

Pale brown generally. On back five oblique dusky brown saddles, inclined little forward and reflected on bases of dorsal. Postocular region deep brown, in contrast with cheek and opercle below. Fins otherwise pale brownish.

Mauritius and Zanzibar to the East Indies, Micronesia and Samoa. A strongly marked species, with but very slight variations, other than those due to age. The main color pattern even constant. Most examples in alcohol show three whitish longitudinal streaks along the lowest three rows of scales of the abdomen. Sometimes a rather dark longitudinal streak extends from the pectoral axil to the base of the lower caudal lobe.

5055 and 5056. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 175 to 200 mm.

11952. Alimango Bay, Burias Island. March 5, 1909. Length, 196 mm.

4035. Off Bacun River, Sipadan Island. 9-foot Tanner trawl, 347 fathoms. September 28, 1909. Length, 202 mm. (D. 5586.)

7458. Bolalo Bay, Palawan Island. December 21, 1908. Length, 233 mm. Yellowish, with dusky saddles; teeth white; lips orange.

10678. Bubuan Island. February 14, 1908. Length, 168 mm. [91.] General color greenish yellow; top of head darker and three dark blotches on upper side and back. Top of caudal peduncle dusky; tips of scales on caudal peduncle with posterior region dusky. Dorsal greenish dusky. Caudal same, with orange shades. Anal canary, with dusky. Ventral pinkish white. Pectorals cadmium above, hyaline below. Chin and lower part of head and breast with pink shades. Teeth white. Upper lip pinkish buff. Iris with brown golden and silver shades.

18764 and 18765. Busin Harbor, Burias Island. March 7, 1909. Length, 195 to 208 mm.

7105. Busin Harbor. March 8, 1909. Length, 136 mm.

5652 and 5653. Busin Bay, Burias Island. April 23, 1908. Length, 199 to 245 mm. Color brassy yellow on middle of sides, becoming somewhat olivaceous and paling to white below; salmon wash on lower head and breast; top of head and nape olive; about three broad saddles of olive on back equal to interspaces; upper lip orange, diffusing into olive on snout, most marked in larger specimens; lower lip very pale orange, color continued backward including chin; teeth white; dorsal pale uniform olive; caudal same, with orange shades; anal uniform pale brassy; ventral pale salmon; pectoral brassy yellow, approaching orange; iris dusky golden.

7771. Candaraman Island. January 4, 1909. Length, 210 mm. Brassy, with dusky saddles.

12354. Candaraman Island, Balabac. June 14, 1909. Length, 180 mm.

12955 and 17402. Candaraman Island. June 4, 1909. Length, 141 to 144 mm.

11184. Canmahala Bay, Ragay Gulf. March 11, 1909. Length, 173 mm.

7617. Cataingan Bay, near ship's anchorage. April 17, 1908. Length, 184 mm.

7728. Caxisigan Island, near Balabac. January 2, 1909. Length, 205 mm. Teeth white; sides brassy, with dark saddles.

7575. Endeavor Strait. December 23, 1908. Length, 243 mm.

15463 and 16639. Galera Bay, Mindoro. June 9, 1908. Length, 175 to 182 mm.

4936 and 4937. Iloilo market. March 29, 1908. Length, 146 and 180 mm. Golden green; back crossed by four dusky saddles equal in width to interspaces; first indefinite, about front of dorsal; fourth under posterior part of dorsal;

belly white, and flush of salmon on lower head and breast; head olive green above; upper lip with salmon shades; dark on top of head, becoming more pronounced in an indefinite stripe from above mouth corner through eye, ending in sort of blotch on postocular region. On lower sides and belly edges of scales bright golden green, hinder areas more dusky. Dorsal body color, spinous margin narrowly indefinitely slaty. Caudal yellowish olive. Anal still lighter. Ventral washed with salmon. Pectoral lemon yellow, verging toward orange above. Teeth white. Iris bronzy, pupil with green reflections.

6364. Jamelo Bay. July 13, 1908. Length, 196 mm. Teeth white; dusky saddles above.

4806. Jolo market, Jolo. February 8, 1908. Length, 250 mm. (D. 5368.)

9361, 13347, and 18552. Langao Point, Luzon. June 24, 1909. Length, 181 to 206 mm.

11979. Little Santa Cruz, Zamboanga. March 26, 1908. Length, 145 mm.

20921. Little Santa Cruz. May 26, 1908. Length, 163 mm.

6663. Little Santa Cruz Island. May 28, 1908. Length, 197 mm.

15203. Mactan Island, Cebu. March 25, 1909. Length, 205 mm.

5404. Mactan Reef. April 6, 1908. Length, 193 mm. Olivaceous to yellow, with saddles of blackish; nose and chin with orange; teeth white; dorsal olive; caudal same, with an orange wash; anal pale yellow; breast, belly, and ventrals white; pectoral with hyaline cadmium.

15792. Makesi Island. Palawan Island. April 5, 1909. [1500.] Teeth white. Lips pale bluish green. Forehead and stripe behind eyes as in *Callyodon dimidiatus*. Green from mouth corner extends backward under eye. Greenish stripe behind chin, with pale lavender dividing same from lower lip. Nuchal region dusky. Dorsal margin slaty, central bar very obscure. Back crossed by three yellowish and three dusky saddles. Lower side pale. Anal pale bluish, with broad translucent reddish median bar. Caudal body color, dashed with red. Ventrals pale bluish, lightest in front. Pectorals bluish above and at base, hyaline olive below, without central strip except an intensification of color above. In general shade very much lacking in greens, rather pale bluish or lavender.

15892, 16397. Mansalay, Mindoro. June 4, 1908. Length, 158 to 200 mm.

16156. Mantacao Island, west coast of Bohal. April 8, 1908. Length, 149 mm.

17445. Mompog Island, near Marinduque Island. March 3, 1909. [1203.] Length, 190 mm. Upper lip and lower head with orange shades; pectoral yellow, bright above; sides with more or less dusky bars.

18614. Same data. Length, 210 mm.

19865. Nabatas Point, Samar. July 24, 1909. Length, 158 mm.

7657. Oyster Inlet, Ulugan Bay. December 28, 1908. Length, 248 mm. General color olivaceous, light. Head dark dusky olive, also snout. Two broad bars of same color as head on upper half of side and much broader blotch at soft dorsal blotch and over back of caudal peduncle. Iris yellow. Teeth white. Chin rosy; breast white; upper lip edged orange; lower lip with pink edge. Dorsal olivaceous, with slight uneven wash of pale yellow. Anal very pale olivaceous, color of belly. Upper half of hind caudal edge dark. Pectoral dusky yellow, darker on upper part and bright yellow at tip. Ventral dirty white.

7963 and 7964. Pagapas Bay. February 20, 1909. Length, 176 to 207 mm.

14648. Parang, Mindanao. May 23, 1908. Length, 173 mm.

21341. Pendek Island. December 15, 1909. Length, 170 mm.

5887. Polloc. May 22, 1908. Length, 200 mm. Olivaceous, with dusky saddles. Teeth whitish. Lips with very pale orange shades.

13135. Same data. Length, 174 mm.

6417. Port Galera, Mindoro. June 9, 1908. Length, 234 mm.
6371. Port Jamelo. July 3, 1908. Length, 233 mm.
11021. Port Maricaban. July 21, 1908. Length, 168 mm.
7279. Port Matalvi. November 23, 1908. Teeth whitish. Gray with brassy shades. Dark saddles on back. Lips more or less orange. Two examples, 178 to 193 mm.
7253. Same data. Length, 202 mm.
5803. Pujada Bay. May 15, 1908. Length, 212 mm. Yellowish, with dark saddles.
12060 and 12061. Same data. Length, 161 to 192 mm. [627, 628.]
5279. Romblon. March 25, 1908. Length, 178 mm. Brassy yellow, saddles above blackish, lower parts white; top of head dusky till even with lower edge of eye, more marked dusky stripe behind eye broad; teeth white, soiled with vinaceous; fins similar to adjacent body color, except anal more yellowish and ventral with orange wash.
5287. Same data. Length, 207 mm.
10918 and 11895. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 148 to 198 mm.
12213. Santa Cruz Island, Marinduque. April 24, 1908. Length, 183 mm.
A623. Simaluc Island. September 23, 1909. Length, 235 mm.
19561. Singaan Island. September 21, 1909. Length, 196 mm.
5020. Surigao, Mindanao. May 8, 1908. Length, 153 mm.
8668. Tara Island. December 15, 1908. Length, 208 mm.
4969. Tataan Island, Tawi Tawi Group. February 28, 1908. Length, 193 mm.
8254 to 8256, 13156. Tumindao Island, southern Luzon. February 26, 1908. Length, 116 to 141 mm.
7708. Ulugan Bay, Palawan Island. December 29, 1908. Length, 238 mm. General color brassy, with black saddles. Teeth white.
7691. Same data. Length, 183 mm.
7167 and 7168. West Coast Palaui Island. November 18, 1908. Length, 215 to 267 mm. Body brassy yellow. Top of head with three or four dark bands, saddles on back olive. Fins uniform, like adjacent body color. Lower head with orange shades. Breast and belly similar, but much paler. Teeth white.
5004. Length, 227 mm. Dark olive, washed with yellow. Below dorsal three distinct dusky saddles. Front lower surfaces flushed salmon. Ventral lemon yellow. Teeth white.
A993 and A994. Buka Island, Celebes. November 20, 1909. Length, 280 to 332 mm. Teeth white; general color throughout scarlet vermilion, in specimen most marked on borders of scales and on fins; lower head and breast somewhat paler and centers of scales of side probably with slight purplish shade; iris more or less golden internally, scarlet externally; dusky blotch at outer base of pectoral; no bars or markings on any of fins.
A1311. Tifu Bay. December 10, 1909. Length, 280 mm.
51821 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. Length, 210 mm. Paratype of *Callyodon zonularis*.
58031 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Two examples. Length, 138 to 208 mm. As *Callyodon zonularis*.
51752 U.S.N.M. Pago Pago. Bureau of Fisheries. Type of *Callyodon zonularis*.

CALLYODON DUSSUMIERI (Valenciennes)

Scarus dussumieri Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 252. Seychelles.

Pseudoscarus dussumieri Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 46, pl. 8, fig. 1 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 224 (Java).—Guichenot, Mem. Soc. Sci. Nat. Chérbourg, vol. 11, 1865, p. 47

(types, Zanzibar, Madagascar, Reunion).—Boulenger, Proc. Zool. Soc. London, 1887, p. 664 (Muscat).—Day, Fishes of India, Suppl., 1888, p. 804; Fauna British India, vol. 2, 1889, p. 426.—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 309 (Muscat, Java, Ponape, Faté).

Pseudoscarus ismailius Kossmann and Räuber, Zool. Ergebn. K. Acad. Berlin, vol. 1, 1877, p. 27. Red Sea.

Depth 2⅔ to 2⅞; head 2⅗ to 3, width 2⅓. Snout 2⅕ to 2¼; eye 6⅞ to 8, 2⅘ to 3⅕ in snout, 2⅕ to 2¼ in interorbital; mouth cleft 4½ to 4⅘; lips cover ¾ of teeth; 1 or 2 hind canines usually present above, and often 1 each side below; hind nostril in adult four times front nostril or about ⅔ of pupil; interorbital 3¼ to 3⅓ in head, convex, elevated. Gill rakers 17+30, short, flexible, slender.

Scales in lateral line 17 to 19+5 or 6+2; 2 scales above lateral line, 6 below, 5 to 8 predorsal; 3 rows of cheek scales, with lowest row 2 scales on preopercle flange, rarely 1. Scales with 28 to 31 basal radiating striae, apical 52 or 53; circuli very fine.

D. IX, 10, 1, ninth spine 2⅖ to 3½ in head, first ray 2½ to 3¾; A. III, 9, 1, third spine 3⅛ to 4⅖, first ray 2⅗ to 3⅘; caudal 1 to 1⅓, deeply emarginate, tips well exserted; least depth of caudal peduncle 2⅓ to 2⅔; pectoral 1¼ to 1⅔; ventral 1⅔ to 2.

Largely dull uniform brown. Trace of greenish band along upper eye edge and horizontally forward or continued little posteriorly from eye, though not always present. Sometimes greenish line across interorbital connecting eyes. Greenish band around each lip. Iris yellowish brown. Teeth whitish. Fins all brownish like body, edges of vertical ones little darker. Pectoral with submarginal dull rosy brown band above. Caudal with marginal and median transverse greenish band.

Arabia, Zanzibar, and Madagascar to the East Indies, Micronesia and Melanesia.

9621. Agojo Point, Catanduanes Island. June 10, 1909. Length, 187 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 497. Balukbaluk Island. September 12, 1909. Length 262 mm. (Canines, upper, 1—1; lower, 1—1.) Teeth white; top of head pale purplish or slightly slaty; lips blue, pink behind blue and blue or green bar still posterior, extending from corner of mouth back along under eye and becoming diffused on opercle; interocular green bar vertically above eyes, little broader than pupil; short dash of green anterior on interorbital space; occipital region variously shaded with green; dashes of green on opercle, none on cheek or lower head; blue throat line not distinctly continued on ventral surface; scales of back broadly reddish, narrower green bar through center of each, tip of scale transparent shows red below; on middle of side behind pectoral reds become obscure and the general shade pale green; breast and belly pink with blue washes; front and margin of dorsal, anal, and caudal lobes broadly blue. Dorsal body red, base green. Anal green at base, broader at central bar. General color of caudal purplish, paling to reddish in fork terminally; green crescent through middle of fin and short blue bar connecting horns near tip in fork; three green spots at base. Ventrals pale blue. Pectorals purplish, upper rays blue and greenish bar at base of rays on pink fleshy portion.

8638. Biri Channel. June 1, 1909. Length, 283 mm. (Canines, upper, 2—2; lower, 2—1.)

8334. Buang Bay, Talajit Island. March 15, 1909. Length, 428 mm. (Canines, upper, 2—2; lower, 0—0.) Top of head viridian showing pronouncedly on snout and again on nuchal region, also as interorbital bar; just behind and above this bar orange wash becomes more prominent; sides with centers of scales viridian, margins dull orange, below, green becomes much paler and margin looses orange color encroaching on central color until entire surface below becomes pale pearly gray, with more or less greenish shade; teeth pale rosy; upper lip bright orange, lower much paler; green at lower corner of mouth running back under nostril; chin blue, with bright purple wash running as backward stripe behind lower lip and becoming orange; behind this green stripe which blue in median portion, continuing backward along throat as blue stripe; cheek, opercle and lower head dull orange, becoming quite dusky on band of opercle, some ochry shades, same color continues on body above pectoral; dorsal front and margin bright blue, body deep reddish orange, base pale blue, no median bar; caudal viridian, broad orange stripe through lobe, most of base dull ochraceous orange; front margin and base of anal bright blue, central body reddish orange; ventrals very pale, near color of adjacent body, fronts very pale sky blue; pectoral dark blue on its upper and basal portion, becoming hyaline on lower distal region, broad purplish stripe through upper half, not quite reaching tip where rays become yellowish and at base this stripe merges into orange, which crosses fleshy portion of fin as bar; iris yellow, upper portion of eyeball very dark viridian; third green stripe immediately behind eye reaching to scales and dividing an area of dusky ochry; sketch does not show colors below and behind eye; pectoral, ventral and dorsal not true; caudal should replace purples with viridian, orange stripes nearly correct, but orange wash covering caudal peduncle scales at base of fin not shown.

8542. Dalaganem Island. April 8, 1909. Length, 258 mm. (Canines, upper, 1—1; lower, 1—1.) Pale gray olive above in life, becomes smoky purplish after death, paler below. Teeth white. Lips blue, with orange band behind upper and on sides of chin; from lower lip blue runs down throat, with 1 band on chin; behind orange of upper lip blue band runs backward under eye, but continuation on opercle, nor chin stripes above shown in Bleeker's plate not present. Dorsal orange, margin slaty blue and base greenish. Anal orange, margin and base bright blue, without median band. Caudal lobes bluish, with purplish stripe, center of fin yellowish green. Pectoral pale purplish, first ray bluish. Ventral same, but much paler.

8305. Lode Bay, Destacado Island. March 13, 1909. Length, 260 mm. (Canines, upper, 1—1; lower, 1—1.)

7992. Port Banalacan, Marinduque. February 23, 1909. Length, 443 mm. (Canines, upper, 2—2; lower, 0—0.) Head from snout to dorsal dusky viridian, more or less obscure interocular bar through nostrils, somewhat orange tone; scales of back and side viridian, with broad orange margins, probably more whitish in life; lower parts pale, greenish blue shades obtaining more on lower head; upper lip peach; chin blue with overshade of purple which extends backward under green corner of mouth as peach line; behind blue band merging into green reaching scales of cheek; blue median stripe on throat; two dull orange lines behind eye, their length equaling diameter of eye, merging into general dusky orange and yellowish shades of opercle; cheek bluish pearl gray with an indefinite line of green from corner of mouth up and backward under eye; front and margin of dorsal bright blue, base blue for an equal width but paler tint, body of fin brilliant orange red; caudal with outer half of lobes green, inner portion orange, central body of fin bluish green; front margin and base

of anal blue, body of fin purplish orange shade; ventrals with pale green or bluish fronts, remainder almost colorless, slight pinkish shade perhaps; pectoral blue, becoming green at base above, pale stripe originates at base of lower rays, curves upward across fin to point of third and fourth rays, becomes somewhat purplish terminally, yellowish internally; pinkish spot at flesh base of pectoral, probably orange in life; teeth white; iris yellow except above, where color like top of head.

12644. Port Palapag, near northern Samar. June 3, 1909. Length, 182 mm. (Canines, upper, 1—1; lower, 0—0.) [1582.] Teeth white; general body color greenish, scales with purplish or pink margins; head washed with rosy; chin, throat, and belly more or less orange; blue median line from throat to anal fin; lips blue, stripe passing across preorbital under eye and dash of green behind eye; blue chin band and bluish or green on interopercle and edge of opercle; vertical fins with blue fronts and edges; body of dorsal orange, with obscure green bar through center, bluish at base; caudal orange, with blue spots and markings, tip in fork dusky; anal similar to dorsal but color darker; ventrals blue, front and middle, orange; pectorals very pale orange, upper rays and base blue.

A. 1336. Tomahu Island at north end of Bouro Island. December 11, 1909. Large head 162 mm. (Canines, upper, 3—3; lower, 0—0; preopercle scales 2—2.)

A. 842. Talisse Island. November 9, 1909. Length, 395 mm. (Canines, upper, 2—1; lower, 1—1. Viridian green, margin of scales on side and back with orange about one-third or more breadth of green, becomes obsolete under pectoral; top of head more or less olive; two green bars across interorbital region; snout with some purplish shades; teeth white; lips blue, orange band above blue on upper lip, above which blue again, fusing down corner of mouth to eye; two blue bands across chin with orange between and behind, also blue median line, orange on either side on breast and abdomen and obscure orange stripe above on abdomen. Dorsal and anal blue in front and at margin, green at base and lavender; medianly orange; inframarginal or central area of pale yellow on caudal peduncle below caudal; edges of caudal lobes greenish blue, body of fin purplish with green crescent in center, terminally more or less orange in fork; ventrals bluish; pectorals blue above, purple through center and somewhat hyaline on lower terminal rays.

A. 829. Same data. Length, 333 mm. (Canines, upper, 3—2; lower, 2—1.)

CALLYODON OVICEPS (Valenciennes)

Scarus oviceps Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 244. Tahiti.

Pseudoscarus oviceps Guichenot, Mem. Soc. Sci. Nat. Chérbourg, vol. 11, 1865, p. 43 (type).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 312, pl. 152, fig. *a* (Ponape, Pelew Islands, Gilbert Islands, Samoa, Society Islands, Paumotus).

Pseudoscarus zonatus Macleay, Proc. Linn. Soc. New South Wales, vol. 7, 1883, p. 591. New Guinea.

Scarus lupus Fowler, Proc. Acad. Nat. Sci. Phila., 1899, p. 49, pl. 18, fig. 1. Thornton Island.

Depth 2⅗ to 2¾; head 2¾ to 2⅘, width 1⅞ to 2⅛. Snout 2⅛ to 2¼; eye 5⅗ to 6½, 2⅔ to 3 in snout, 2 to 3⅓ in interorbital; mouth cleft 4¼ to 5⅗ in head; lips largely cover teeth; no canines; interorbital 2¾ to 3, convex. Gill rakers 16+30, slender, fine, flexible.

Scales in lateral line 19 or 20, 4 or 5+2; 2 scales above lateral line, 6 below, 5 predorsal; 3 rows of scales on cheek, of which lowest row of 3 scales on preopercle flange. Scales with 24 to 25 basal radiating striae, apical 24 to 26; circuli very fine.

D. IX, 10, 1, ninth spine 2½ to 3⅖ in head, first ray 2⅖ to 3; A. III, 9, 1, third spine 3 to 3⅞, first ray 2¾ to 2⁵/₆; caudal 1⅛ to 1⅖, concave behind; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1⅓ to 1½; ventral 1⅘ to 2.

Pale brown generally. Upper surface of head till level with lower eye edge and fore part of back deep brown; pale space like belly intervenes opposite end of depressed pectoral and posteriorly back light brown. Iris and teeth whitish. Sometimes horizontal yellow bar from upper front eye edge and short one from upper hind eye edge. Also border of dark area below and upper lip yellow. Lower lip yellow and yellow line across chin. Dorsals gray or whitish, spinous fin dark marginally, upper edge yellow. Caudal yellow, bases of lobes pale grayish. Pectoral deeper brown terminally, basally pale, upper edge yellow. Ventral and anal whitish, latter with lower two-thirds yellow.

Not previously reported from the East Indian region, though widely distributed in Oceania. Said to reach 356 mm.

A. 534. Tambul Sigambul. September 14, 1909. Length, 273 mm.
A. 514. Tapiantana Island. September 13, 1909. Length, 280 mm.
A. 1415. Makassar market, Dutch East Indies. December 22, 1909. Length, 237 mm.
52383 U.S.N.M. Apia, Samoa. Bureau of Fisheries. 5 examples. Length, 70 to 250 mm.

CALLYODON PECTORALIS (Valenciennes)

Scarus pectoralis Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 269. Djedda, Red Sea.

Pseudoscarus pectoralis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 237 (compiled).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1866, p. 55 (type).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 21, 1871, p. 565 (Koseir, Red Sea).—Capello, Jorn. Sci. Lisbon, 1872, p. 83 (Mozambique).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 324, pl. 158 (Seychelles, Zanzibar, Upolu, Pelew, and Society Islands).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 387 (Karkaralong Island).

Callyodon lazulinus Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 333, fig. 65. Apia and Pago Pago, Samoa.

Callyodon elerae Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907) p. 31, fig. 11. Cavite.

Depth 2⅗ to 2⅔; head 2⅞ to 3, width 2⅙ to 2⅕. Snout 2⅕ to 2¼; eye 6½ to 7, 2¾ to 2⅞ in snout, 2¼ to 2¾ in interorbital; mouth cleft 4⅙ to 4⅔ in head; lips largely cover teeth; canines usually 1 or 2 above each side, rarely present below, sometimes entirely absent; interorbital 2½ to 3, convex. Gill rakers 15+25, fine, short, flexible.

Scales in lateral line 16 to 19, 5+2; 2 scales above lateral line, 6 or 7 below, 6 predorsal; 3 rows of scales on cheek, of which lowest row of 3 scales on preopercle flange. Scales with 35 or 36 basal radiating striae, apical 36 or 37 imperfect; circuli fine.

D. IX, 10, 1, ninth spine 3 to 3¼ in head, first ray 2⅘ to 3⅛; A. III, 9, 1, third spine 2 to 3⅛, first ray 2¾ to 3; caudal 1⅛ to 1½, deeply concave behind, points well exserted; least depth of caudal peduncle 2 1/10 to 2¼; pectoral 1⅓ to 1⅔; ventral 1¾ to 1⅞.

Body dull brown generally. Top of head, predorsal and front of back to sixth scale of lateral line deep brown in contrast. Broad yellowish band across upper lip and to lower eye edge. Teeth greenish. Dorsals pale brown, with deeper marginal band. Anal yellowish basally, with outer portion broadly pale olive. Caudal brown, with grayish longitudinal streak on median rays of each lobe. Pectoral pale brown, with broad dark longitudinal band. Ventral brown, inner rays paler.

Red Sea, Seychelles, Zanzibar, Philippines, to the Society Islands. We find that *Callyodon lazulinus* and *C. elerae* do not in any way differ from the present species.

7955. Balayan Bay, Luzon Island. Length 278 mm. (Canines upper, 2—2; lower, 1—2.) Teeth white; upper lip very narrowly pale orange; above yellowish greenish covering rounded snout and most of top of head; opercular surface and hinder part of cheek dusky yellowish green; lower lip and chin pale blue behind peach, then blue band running into green, which carried down from top of head across preorbital; behind smoky peach, becoming almost slaty at edge of interorbital and on breast; back and side green with more or less purplish overshade, margins of scales purple; lower parts smoky purple, becoming yellowish on belly and breast; blue band across throat and dash of blue and green through interopercle; broken blue stripe through centre of belly; basal half of dorsal dark green, front and margin blue, bronzy yellow band under blue rising from root of second spine of almost even breadth throughout; edge of caudal lobes blue, smoky purplish stripe through each, central portion of fin green, slightly paler than body; front and terminal third of anal blue, basal third dark green, central third purplish; ventrals blue with purple stripe through second ray and bar like off shoot near base; pectorals dark green with very bright stripe covering upper half except first ray of dark smoky purple.

6497. Balikias Bay. July 17, 1908. Length, 353 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth indigo. Upper lips broadly orange, lower very narrowly purple, broadly blue behind and orange still posteriorly. Broad green band across snout, continues backward under eye, disappears on opercle; dash of green through upper eye. Top of head olivaceous, with orange shade in front. Back green, margins of scales geranium, fading out bluish lilac shades below. Front and margin of dorsal and anal blue, body purplish orange to red, base olive. Edges of caudal lobes blue, broad red stripe through each, body green basally, bluish terminally. Ventral pale bluish green in front, reddish shades in rays. Pectoral purplish, upper rays bluish green. Iris golden.

8333. Buang Bay, Talajit Island. March 15, 1909. Length, 324 mm. (Canines, upper, 2—2; lower, 0—0.) Teeth indigo; posterior and middle side distinctly red and breast and lower head with olive green wash over pale bluish green

ground color; upper lip bright orange, green stripe behind across snout only about half width of pupil, passes backward to hind preopercular margin; another narrow green stripe runs from nostril through top of eye to upper corner of gill opening; very short dash of green behind middle of eye; lower lip blue in center, becoming green at corner of mouth; chin orange, stripe passing upward and merging into dusky greenish orange of cheek; blue stripe behind chin, which covers in addition most all branchiostegal membranes; stripe on interopercle, including little of lower preopercular line blue. Margin of dorsal and anal blue, body of dorsal orange red, base blue; anal similar but body color paler, with more purplish cast; caudal bluish green, base purplish, running into bright orange red stripe through each lobe, central body of fin with yellowish shade, becoming bluish at tip; ventrals pale blue, fronts not so distinctly contrasted as usual; pectoral body purplish, terminal portion dusky hyaline, three or four upper rays dark green, color continued as green bar terminal to orange bar, which crosses base.

8336. Same data. Length, 350 mm. (Canines, upper, 1—2; lower, 0—0.)

8373. Calangaman Island. March 11, 1909. Length, 300 mm.

6223 and 6227. Galera Bay. June 9, 1908. Length, 192 to 287 mm. (6223.) Teeth green. Upper lip purplish pink, lower blue and shades into green at mouth corner. Top of head and anterior back smoky purple, reaching lower eye edge; pale viridian line under eye to snout; short green stripe above eye and dark behind eye. Pectoral yellowish green above, bright purple medially, hyaline and blue green below. Chin with broad pink band. Interopercle pinkish anteriorly behind blue band. (6227.) Teeth white, with pale blue bases.

6252. Same data. Length, 268 mm. Teeth green.

A 1213. Gomomo Island. December 3, 1909. Length, 324 mm. (Canines, upper, 1—1; lower, 0—0.)

4579. Grande Island reef, Subig Bay. January 8, 1908. Length, 273 mm.

8371. Malapascua Island. March 16, 1909. Length, 280 mm. (Canines, upper, 1—1; lower, 0—0.) Similar to Buang Bay example. Teeth indigo. Upper lip orange, lower bluish-green; chin orange and blue-green band across snout and under eye, another above eye. Dorsal scarlet and blue. Caudal scarlet to purple at tips. Anal pale purple and blue. Pectoral orange at base, blue and purple.

6525. Maricaban Island Reef. July 21, 1908. Length, 337 mm. (Canines, upper, 1—1; lower, 0—0.) Teeth green; inside of mouth reddish; upper lip scarlet; broad band of green on nose running backward under eye; lower lip narrowly reddish, and behind blue, again pink merging into lilac tones of under side of head and breast; top of head purplish slate; front and margin of dorsal and anal blue, body of fins geranium red, base green; an obscure row of blotches in front portion of dorsal; edges of lobes and middle body of caudal bluish green, with purplish shades at base, merging into red stripe below; pectoral green in upper portion, lower lilac.

8771. Masamat Bay, Quinalasag Island. June 12, 1909. Length, 248 mm. (Canines, upper, 1—1; lower, 1—1.)

7993. Port Banalacan, Marinduque Island. February 23, 1909. Length, 314 mm. Teeth indigo; upper lip broadly orange; above this band of dark green passes backward under eye becoming extinct in after portion of opercle; above this top of head and anterior body dark smoky purple; below cheeks with reddish shades; lower portion of head and breast bluish; lower lip very narrowly orange; below this bright band which blue mesially, becoming green at corner of mouth; back and posterior region dark green, scales with bright reddish edges, more or less definite greenish stripe from lower base of pectoral back-

ward to just above lower edge of caudal peduncle. Dorsal fin with front and margin broadly blue with distinctly green shade below, this band much broader in front than behind, fin greenish at base, body orange red. Caudal green at edges of lobes and centrally, broad orange stripe through each lobe showing purple shades basally. Anal front and margin broadly bluish green, some green at base extending into half ray, internally fin similar to dorsal but paler. Ventrals with green fronts. Pectoral with first three rays green below, which purplish, lower rays with dusky green shades terminally. Iris orange.

7303 and 7304. Sablayan, Mindoro Island. December 12, 1908. Length, 285 to 303 mm. (7303.) Teeth indigo; upper lip orange, lower narrowly so, with blue band behind; lower head and middle of body red; dusky green above anteriorly, bright posteriorly; dorsal and anal with blue green margins, body broadly orange, blue at base; caudal blue green, with reddish stripe through each lobe, similar stripe through body centrally. (7304.) Teeth indigo; same as 7303, but reds less brilliant; central stripe of pectoral reddish brown.

9308. Silino Island. August 10, 1909. Length, 280 mm. (Canines, upper, 1—1; lower, 0—0.) Teeth indigo; upper lip orange, with greeen bar across which passes backward under eye to below point of opercle; lower lip blue, in front becoming greenish in corner of mouth, stripe joining upper; blue stripe on interopercle; blue band back of chin and blue throat line; dorsal with bluish green front, margin and base, body pale reddish orange; anal similar, blue margin broader, base narrower; caudal green, purplish stripe through each lobe becoming orange terminally; pectoral blue above continued as bar nearly across base, remainder of fin purplish.

A. 620. Simaluc Island. September 22, 1909. Length, 330 mm.

A. 755. Sipadan Island. September 29, 1909. Length, 247 mm.

A. 664. Sitanki Reef, northwest of Tumindao Island. September 24, 1909. Length, 300 mm. Teeth blue; upper lip orange; green stripe above passing backward under eye; lower lip blue, orange behind fading into reddish wash on lower side of head; purple stripe through upper middle of pectoral, green above; front and margin of dorsal very broadly blue; anal more so, basal portion of both fins orange; narrow blue bar at base; caudal bluish green, broad orange bar in each lobe; greenish irregular line curves from base of pectoral somewhat downward and thence backward, separating color of side from that of lower parts.

5798. Tataidaga Point, Pujada Bay, Mindanao. May 15, 1908. Length, 212 mm.

7155. West Coast Palaui Island. November 18, 1908. Length, 312 mm. Body greenish above and posteriorly, smoky olive on top of head and anterior back. Lower surface lilac gray. Middle of side with overshades of reddish as conspicuous margins of scales, sharply defined from under surface by greenish line from pectoral base to caudal. Cheek and side of head reddish. Teeth indigo. Upper lip broadly orange, lower narrowly orange. Broad band across snout bright green, extends back below eye obscurely to opercle angle. Chin with blue band. Dorsal with blue margin and base, median third orange, beginning on third spine and including tips of penultimate and antero-penultimate rays, bands purple anteriorly. Caudal lobes edged bluish green, median area of fin same with bright orange stripe through center of each lobe. Anal like dorsal, blue more extensive. Upper third or two-fifths of pectoral bluish green, base orange, becomes purple through center of fin, hyaline terminally. Front of ventral pale blue, rim of fin with pale orange shades.

A. 1445 and A. 1446. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 310 to 315 mm. (A. 1445, canines, upper, 0—2; lower, 0—0; A. 1446, canines, upper, 1—2; lower, 0—0.) Teeth indigo, upper lip scarlet orange, above broad green stripe passing backward under eye fading out about margin of preopercle; front and margin of dorsal and anal and edges of caudal lobes blue, body of dorsal and anal orange scarlet, base narrowly blue; stripes of scarlet through caudal lobes, middle of fin greenish blue; pectoral green above, hyaline lilac below; ventrals bluish; greenish stripe runs from base of pectoral backward along upper portion of second row of scales, from below running into the other green at middle of base of anal.

51758. U.S.N.M. Samoa. Bureau of Fisheries. Type of *Callyodon lazulinus*.

CALLYODON LINEOLABIATUS, new species

Depth 2⅞; head 3⅛, width 2. Snout 2⅘; eye 5⅕, 2 in snout, 2 in interorbital; mouth cleft 5 in head; lips largely cover teeth; no canines; interorbital 3, broadly convex. Gill rakers 10+20?, short, flexible, slender.

Scales in lateral line 19, 5+2; 2 scales above lateral line, 6 below, 7 predorsal; cheek with 3 rows of scales, of which lowest of 2 scales and separated on preopercle flange. Scales with 24 to 26 basal striae, apical 25 or 26; circuli very fine.

D.IX, 10, 1, ninth spine 2¾ in head, first ray 2⅓; A.III, 9, 1, third spine 3⅖, first ray 2⅔; caudal 1¼, slightly emarginate; least depth of caudal peduncle 2⅕; pectoral 1⅓, rays 1, 13; ventral 1¾.

Dull uniform brown, little paler to whitish on under surface of head and below. Pale band across upper lips. Lower lip whitish and another whitish band across chin. Iris dull yellowish brown. Dorsals brownish, spinous fin with deeper brown submarginal line. Anals whitish, with brownish submarginal line. Caudal and pectoral pale brownish. Ventral whitish.

Known only from a single specimen, 19185. Butauanan Island. June 12, 1909. Length, 183 mm.

This species approaches *Callyodon dubius* but differs in the presence of distinct pale lines or bands across the lips, one above and the other below.

Type.—Cat. No. 89976, U.S.N.M.

(*Linea*, line; *labrum*, lip.)

CALLYODON BALINENSIS (Bleeker)

Sacrus balinensis Bleeker, Verh. Batav. Genootsch. (Bali), vol. 22, 1849, p. 8. Bali.

Pseudoscarus balinensis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 39, pl. 16, fig. 31 (Bali and Banda).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 38 (Cebu and Manado).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 560 (Luzon, Pasacao, Camarines, Cebu).

Callyodon balinensis Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 509 (Okinawa).

?*Pseudoscarus moresbyensis* Macleay, Proc. Linn. Soc. New South Wales, vol. 7, 1883, p. 590. New Guinea.

Depth 2½ to 2⅞; head 3 to 3⅕, width 2⅛ to 2⅙. Snout 2⅙ to 2⅓; eye 5¾ to 7⅗, 2⅓ to 3⅓ in snout, 2 to 2⅖ in interorbital; mouth cleft 4⅓ to 5⅕; lips cover ¾ of teeth; canines absent, or variably 1 or 2 above or below; interorbital 3 to $3\frac{1}{10}$, convex. Gill rakers 24+22, short, weak filaments.

Scales in lateral line 19 or 20, 5+2; 2 scales above lateral line, 6 below, 8 predorsal; 3 rows of cheek scales, of which lowest row contains 2 scales on preopercle flange. Scales with 25 to 30 basal radiating striae, apical 45 to 50; circuli very fine.

D. IX, 10, 1, ninth spine 2¾ to 3 in head, first ray 2⅗ to 2¾; A. III, 9, 1, third spine 3 to 3⅛, first ray 2⅔ to 2⅞; caudal 1⅕ to 1¼, deeply emarginate; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1⅖ to 1½; ventral 1¾ to $1^{5}/_{6}$.

Deep drab gray generally, becoming cream buff on under surface of head and abdomen. Teeth whitish. Iris brownish. Fins brown. Dorsals and anals with narrow brown edge to each and anal with brown longitudinal basal band. Upper pectoral edge darker than rest of fin.

East Indies. A plainly colored species, with emarginate caudal and pale teeth. Among the following are some, evidently discolored in alcohol, which appear to be closer to their species than any other.

8335. Buang Bay, Talajit Island. March 15, 1909. Length, 278 mm. (No canines.)

5663. Busin Harbor, Burias Island. April 23, 1908. Length, 250 mm. (No canines.)

5310. Cebu market. April 4, 1908. Length, 270 mm. (No canines.) General color olivaceous, scales edged yellowish brown, lower surfaces of body white. About 6 irregular bars of azure. Top of head gray, blue interorbital bar slightly narrower than pupil. Upper lip slightly brownish, with blue band; blue stripe from below mouth corner to below eye; 1 or 2 blotches above and behind eye; blue band behind chin continued backward on median line. Teeth white, slightly rose tinged. Dorsal and anal with front and edges blue, blue basal blotches, and medial fin orange. Pectoral blue at base, rest of fin pale yellow. Ventral with front blue, rest pale orange.

4575. Grande Island Reef, Subig Bay. January 8, 1908. Length, 195 mm. (No canines.)

4819. Jolo market, Jolo. February 9, 1908. Length, 342 mm. (Canines, upper, 1—1; lower, 0—0.)

5775. Mahinog, Camiguin Island. May 3, 1909. Length, 359 mm. (Canines, upper, 1—1; lower, 0—0.)

7415. Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 370 mm. (No canines.)

7971. Pagapas Bay. February 20, 1909. Length, 285 mm.

5889. Polloc. May 22, 1908. Length, 222 mm. (No canines.)

7995 and 7996. Port Banalacan, Marinduque. February 23, 1909. Length, 300 to 338 mm. (No canines.)

4997. Ragay River. March 10, 1909. Length, 245 mm. (No canines.) General color pale olivaceous, dusky above and slight shades of purple on breast. Dorsals washed with brown. Anal with purplish and brownish

shades. Paired fins with very light purplish shades and dark brown blotch on upper region of pectoral. Teeth white.

5039. Sitanki Wharf. February 27, 1908. Length, 367 mm. (Canines, upper, 2—2; lower, 0—0.) General color pale chrome and blue. Teeth white. Lips orange. Streaks on head blue.

4940. Tataan, Tawi Tawi Group. February 20, 1908. Length, 273 mm. (No canines.) Scales margined with orange; centers and area covered by four irregular bars azure blue, interspaces dusky lilac; lower head, breast, and belly pale, flushed with salmon; nuchal region with blue mottlings; blue bar little wider than pupil curves forward from upper front of one eye to opposite; short radiating lines curve around upper and posterior rim of orbit; serrated blue line below eye passes downward to below corner of mouth; blue band crosses tip of snout setting off narrow orange of lip, another behind chin; lower lip orange, pale in center; a median blue line on branchiostegal region; blue spot on subopercle on either side. Dorsal pale orange, front and upper edge blue and blue at base. Caudal dull purplish, dusky at tip edged with blue. Anal similar to dorsal. Ventral with salmon shades, front edge blue. Pectoral lemon yellow, top edged blue. Teeth pinkish white. Iris golden.

A. 572. Tutu Bay, southern Jolo. September 19, 1909. Length, 279 mm. (No canines.)

6841. Kowloon market, China. Length, 330 mm. (No canines.)

CALLYODON VIRIDIBUSIUS, new species

Depth 2⅗ to 2⅞; head 2⅞ to 3⅙, width 2⅕ to 2¼. Snout 2⅓ to 2½; eye 6 to 6⅘, 2⅕ to 2½ in snout, 2 to 2¼ in interoribtal; mouth cleft 4⅘ to 5 in head; lips cover ¾ of teeth; canines absent, rarely small, obsolete one above each on either side; interorbital 3 to 3⅕ in head, broadly convex. Gill rakers 17+26, short, flexible, slender.

Scales in lateral line 18+5+2; 2 scales above lateral line, 6 below, 7 or 8 predorsal; 3 rows of scales on cheek, of which lowest row of 3 to 5 scales on preopercle flange. Scales with 22 to 24 basal striae, apical 20 to 27; circuli very fine.

D. IX, 10, 1, ninth spine 2⅞ to 3 in head, first ray 2⅘ to 3⅛; A. III, 9, 1, third spine 2⅘ to 3⅗, first ray 2⅞ to $2\frac{8}{10}$; caudal 1⅖ to 1⅗, slightly concave behind; least depth of caudal peduncle 2¼ to 2½; pectoral 1⅖ to 1⅗; ventral 1⅘ to 1⅞.

Body deep dusky green, head and breast dark neutral brown; caudal peduncle posteriorly and caudal fin dull brown. Eye golden brown. Teeth white. Dorsals neutral dusky. Anal grayish to pale brown. Paired fins brownish.

East Indian region. This species appears to approach *Callyodon ghobban* in its well-scaled cheeks, though its colors are largely uniform and without any variegation on the head.

Type.—Cat. No. 89977, U.S.N.M.

5165. Iloilo market. June 1, 1908. Length, 244 mm. (Canines, upper, 0—1; lower, 0—0; preopercle scales, 4—5.)

9242. Rapurapu Island. June 22, 1909. Length, 225 mm. (Preopercle scales, 3—5.) Head slaty. Teeth very pale rose. Centers of scales above metallic olive green, margins broadly slaty bluish on side of abdomen, with chrome

yellow wash on lower two rows above ventral tip; pinkish above anal base. Dorsal hyaline slaty. Caudal brighter, geranium red with last two or three scales. Anal pink. Pectoral slaty above, dusky hyaline below. Ventral hyaline. Iris golden.

19076. Silino Island. August 10, 1909. Length, 196 mm. (Preopercle scales, 4—4.) [1810.] Teeth very pale rosy, almost white; caudal and anal geranium; upper half of body metallic olive, lower half bluish, rather purplish on upper abdominal region.

A. 1312. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 262 mm. (Preopercle scales, 5—4.)

A. 1259. Uki, Bouro Island. December 9, 1909. Length, 255 mm. (Preopercle scales, 5—5.)

A. 909. Limbe Strait, Celebes. November 11, 1909. Length, 227 mm. (Canines, upper, 1—0; lower, 0—0; preopercle scales, 4—3.)

(*Viridis* green; *busius* bise, hence bise green or dusky green.)

CALLYODON TRICOLOR (Bleeker)

Scarus tricolor BLEEKER, Verh. Batav. Genootsch. (Labroid.), vol. 22, 1849, p. 59. Batavia, Java.

Pseudoscarus tricolor BLEEKER, Atlas. Ichth. Ind. Néerl., vol. 1, 1862, p. 39, pl. 17, fig. 1 (Java, Celebes, Amboina).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 229 (East Indies); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 315 (compiled).—WEBER, Siboga Exp., vol. 57, Fische, 1913, p. 387 (Karkarolong Island).

Callyodon latifasciatus SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 238, fig. 7. Zamboanga.

Depth 2½ to 2⅞; head 3 to 3⅛, width 2$\frac{1}{10}$. Snout 2½ to 2⅗; eye 5⅔ to 6, 2⅖ to 2½ in snout, 2¼ to 2⅖ in interorbital; mouth cleft 4$\frac{1}{10}$ to 4⅛ in head; lips largely or quite cover teeth; canines none or 1 to 3 above each side; interorbital 2 to 2¾ in head, convex. Gill rakers 20+32, short, flexible, slender.

Scales in lateral line 19, 5 or 6+2; 2 scales above lateral line, 6 below, 7 or 8 predorsal; 3 rows of scales on cheek, of which lowest row as 3 or 4 scales on preopercle flange. Scales with 27 basal radiating striae, apical 26 to 34; circuli fine.

D. IX, 10, 1, ninth spine 2$\frac{9}{10}$ to 3¼ in head, first ray 2⅖ to 3¼; A. III, 9, 1, third spine 3⅛ to 3⅖, first ray 2⅔ to 3; caudal 1⅙ to 1⅓, slightly emarginate; least depth of caudal peduncle 2 to 2⅛; pectoral 1⅓ to 1½; ventral 1⅗ to 1¾.

Generally dull brown, under surface very pale brown. Entire side of head, trunk, and front of tail to caudal peduncle, violet. Fins all dull brown, paired ones little paler. Pectoral base neutral brown. Teeth pale brownish.

East Indian region. Most of our examples show no trace of the blue longitudinal subbasal band on the dorsal fins, as shown in Bleeker's figure. Moreover they differ a little further in the dark pectoral base. Some have the lateral blue area extending back over the sides of the caudal peduncle.

15445. Calangaman Island. March 16, 1909. Length, 189 mm. [1380.] With purple blotch on side.

10831. Dalaganem Island. April 8, 1909. Length, 218 mm. (Canines, upper, 2—2; lower, 0—0.)

6622. East side of Verde Island. July 22, 1908. Length, 244 mm. (Canines, upper, 1—2; lower, 0—0.)

9756. Endeavor Strait, beach village near Chase Head, Palawan. December 22, 1908. Length, 199 mm. [1799.] Back lavender gray, lower surfaces drab. Snout pinkish. Iridescent steel blue and green above pectoral, fading toward caudal. Whitish spot above middle. Fins pinkish, without bars.

4583. Grande Reef, Subig Bay. January 8, 1908. Length, 258 mm.

4867. Jolo market. February 13, 1908. Length, 250 mm.

6590. Maricaban Island Reef. July 21, 1908. Length, 230 mm. (Canines, upper, 1—2; lower, 0—0.) Lips bright red; lower parts white, with pink wash, upper smoky purplish; teeth white; fins with reddish shade, no marks.

9277 to 9279. Murcielagos Bay. August 9, 1909. Length, 260 to 280 mm.

7055. Romblon Harbor. March 25, 1908. Length, 203 mm. General color slaty gray above, pink below. Purplish blue from above pectoral base, almost half way to caudal, medially with bright green shades. Teeth white. Lips red. Vertical fins with reddish shades. Dorsal with narrow dusky margin. Paired fins similar, without bars.

7305. Sablayan, Mindoro Island. December 12, 1908. Length, 225 mm. Teeth rosy; lips and lower head scarlet; fins reddish, without bars; purple markings on center of side, faded in specimen.

6914. Santo Domingo. November 7, 1908. Length, 206 mm. Purplish above, pale with red shades below; upper lip and chin scarlet; fins all reddish; dorsal with smoky edge; both dorsal and caudal more or less dusky; pectoral with dusky blotch on base externally; teeth white.

9304. Silino Island. August 10, 1909. Length, 300 mm. Teeth pale green; upper lip broadly orange; broad green band above, each somewhat greater than diameter of pupil; green shade obscurely across preorbital till under eye; lower lip greenish, head otherwise color of adjacent body, probably olive on top in life and gray with olive or vinaceous wash below; back slaty gray, lower surfaces pearl gray; purplish or violet black band runs downward from lower posterior portion of eye across opercles, thence backward behind upper pectoral base to posterior body region; obscure whitish spot above near middle of body somewhat larger than eye. Dorsal dull green on front and margin, base greenish, body of fin olivaceous, becoming orange posteriorly. Caudal greenish gray, with orange shades more marked distally. Pectorals dusky green above, hyaline vinaceous or brownish on main body. Iris more or less silvery.

A. 619 and 16958. Simaluc Island. September 22, 1909. Length, 227 to 258 mm. (16958, canines, upper, 1—0; lower, 0—0.) Teeth rosy; lips pale crimson; vertical fins reddish, dorsal with slightly slaty margin but without bars; purple area above and behind pectoral distinct; lower head, breast, and belly whitish, with slight pink wash.

A. 602. Singaan Island. September 21, 1909. Length, 318 mm.

7159 and 7160. West Coast of Palaui Island. November 18, 1908. Length 217 to 225 mm. Top of head and back dusky olive. Lips, lower head, and ventral surfaces red, almost scarlet. Purple band from back and above pectorals reaches almost under dorsal axil, sometimes with greenish shades. Teeth very pale greenish. Fins red, with dorsal dusky, margin more or less dusky but no bars or marks. Blackish bar at pectoral base.

A. 1501 and A. 1502. Birabirahan Island, Borneo. December 31, 1909. Length, 257 to 283 mm. (A. 1501, canines, upper, 1—1; lower, 0—0.)

A. 1191. Doworra Island, Dutch East Indies. December 2, 1909. Length, 283 mm. Shows purple lateral stripe, other colors not distinct, dorsal probably less brilliant red than in smaller specimen.

A. 1313 and A. 1314. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 342 to 349 mm. (A. 1313, canines, upper 3—1; lower, 0—0; A. 1314, canines, upper, 2—1; lower, 0—0.) Teeth white; snout and lower head with vermilion wash, which fades away leaving it pink; breast and abdomen silvery with pink or reddish wash; middle of side with purple stripe laid on iridescent gray; back slaty to olive; dorsal and caudal pale wine color; anal and paired fins pink; pectoral dusky on upper ray; iris more or less golden.

57845 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Type of *Callyodon latifasciatus*. (Canines, upper, 2—2; lower, 0—0.) Length, 285 mm.

61152 U.S.N.M. Zamboanga. Dr. E. A. Mearns. Paratype of *Callyodon latifasciatus*. Length, 260 mm.

CALLYODON BLOCHII (Valenciennes)

Scarus blochii Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 219. Java.—Guichenot, Notes I. Réunion, vol. 2, 1862, p. 28.

Scarus viridis (not Bonnaterre, 1788) Bloch, Naturg. Ausl. Fische., vol. 4, 1790, p. 29, pl. 222. Japan.—Forster, Fauna Indica, 1795, p. 16.

Pseudoscarus viridis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 45, pl. 17, fig. 3 (Java, Bawean, Duizend Islands, Sumatra, Singapore, Biliton, Celebes, Amboina).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 33 (Bourbon and New Ireland).—Bean and Weed, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 608 (Batavia).

Scarus quoyi (part) Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 273 (New Ireland).—Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 544 (Padang).

Scarus chrysopomus Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 53. Batavia.

Pseudoscarus chrysopoma Günther, Cat. Fish. Brit. Mus., vol. 2, 1862, p. 221 (East Indies).—Day, Fishes of India, pt. 3, 1877, p. 412, pl. 89, fig. 2.—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 38 (Cebu).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 559 (Cebu).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 307 (East Indies, Pelew Islands, Ponape).

Pseudoscarus papuensis Macleay, Proc. Linn. Soc. New South Wales, vol. 7, 1883, p. 590. New Guinea.

Callyodon hadji Seale, Philippine Journ. Sci., vol. 4 (6), 1909, p. 525. Puerta Princesa, Palawan.

Callyodon philippinus Fowler, Proc. Acad. Nat. Sci. Phila., 1918, p. 66, fig. 26. Philippines.

Depth 2⅓ to 2¾; head 2⅘ to 3, width 2 to 2⅛. Snout 2⅖ to 2½; eye 5¾ to 7, 2⅓ to 3⅕ in snout, 1⅞ to 2⅞ in interorbital; mouth cleft 4 to 4¾; upper lip covers teeth; canines rarely absent, usually large and strong, variably 1 or 2 above or below each side; interorbital 2⅓ to 3, convex. Gill rakers 14+27, slender, short, flexible filaments.

Scales in lateral line 19 or 20, 4 or 5+2, tubes slightly branched; 2 scales above lateral line, 6 below, 7 or 8 predorsal; cheek scales in

3 rows, lowest row on flange of 2 or 3 scales. Scales with 26 to 31 basal radiating striae, apical 37 or 38; circuli very fine.

D. IX, 9, 1 or 10, 1, ninth spine 2⅞ to 3 in head, first branched ray 2½ to 2⅔; A. III, 8, 1 or 9, 1, third spine 3 to 3⅛, first branched ray 2¾ to 2⅞; caudal 1⅓ to 1⅔, slightly emarginate, convex behind as expanded, ends but little exserted; least depth of caudal peduncle 2 to 2¼; pectoral 1⅓ to 1⅔; ventral 1⅗ to 1¾.

Brown generally, most scales paler medianly. Scales of dorsal sheath often with pale blotch on each. Short pale yellow line before eye and two behind eye. Lips yellow, with yellow area up to lower eye edge, variably broad or narrow or with blotches below; several yellow variable blotches or spots on throat. Dorsals pale brown, with marginal deeper brown bands, a longitudinal row of median brown spots and pale spots of dorsal sheath more or less conspicuous on base of fin. Anals with broad buff edge, medianly broadly mauve and base narrowly pale. Caudal medianly and terminally yellowish buff, upper and lower rays brownish. Pectoral pale brown, with upper median rays dark brown. Ventral creamy white.

Bourbon and Réunion Islands to India, the East Indies and Micronesia. The description of *Callyodon hadji* agrees in every way with the present species and was founded on an example of average size. The type of *Callyodon philippinus* is a bleached example of the present species. Faint traces of the characteristic markings are still slightly evident.

5054. Alibijaban Island, Ragay Gulf, Luzon. Length, 175 mm. (Canines, upper, 1—2; lower, 2—2.) [1224.]

8367. Atulayan Harbor, Burias Island. April 22, 1908. Length, 208 mm. (Canines, upper, 2—2; lower, 1—2.)

6496. Balikias Bay. July 17, 1908. Length, 208 mm. (Canines, upper, 2—2; lower, 1—1.)

11268. Biri Channel. January 1, 1909. Length, 210 mm. (No canines.)

8655. Biri Channel. June 22, 1909. Length, 182 mm. (Canines, upper, 0—1; lower, 2—2.)

7454. Bolalo Bay, Palawan Island. December 21, 1908. Length, 201 mm. (Canines, upper, 1—1; lower, 1—1.) Teeth white; nose and cheek bright green; lips very narrowly pinkish; lower head reddish, with blue lines and spots; front and edge of dorsal blue, body orange, with obscure green spots in center of anterior portion, bases of spines green; caudal yellowish green, central at tip; pectorals with purplish stripe in upper half.

7251. Busbus Point, Siasi Island. September 20, 1909. Length, 200 mm. (Canines, upper, 1—2; lower, 1—2.)

18766. Busin Harbor, Burias Island. March 7, 1909. Length, 192 mm. (Canines, upper, 0—2; lower, 1—1.)

7194. Busin Harbor. March 8, 1909. Length, 186 mm. (No canines.)

5616. Busin Harbor. April 22, 1908. Length, 190 mm. (Canines, upper, 1—2; lower, 1—1.)

5665. Busin Harbor. April 23, 1908. Length, 203 mm. (Canines, upper, 1—2; lower, 1—2.)

5622. Busin Harbor, Burias Island. April 22, 1908. Length, 224 mm. (Canines, upper, 1—1; lower, 1—2.) Back dark emerald, each scale with reddish line at base, side dull rose red; top of head dull grass green, with lilac area in front; upper lip chrome green; side of head and breast various shades of pink; spots and lines of azure blue on underside of head and median line of breast, also of abdomen; region posterior to pectoral salmon pink, merging into other color; bright chrome green area anterior to and below eye. Dorsal margin caerulean, remainder of fin scarlet, except central green incomplete stripe, scales at base with bright blue edges. Caudal scores blue, posterior central part emerald. Anal with basal three-fifths lilac, outer part azure. Ventral broadly azure anteriorly, remainder vinaceous cinnamon. Pectoral azure, with broad submarginal scarlet vermilion stripe extending from base to tip. Some dark blue lines around eye.

16658. Canimo Island, near Daet. June 15, 1909. Length, 194 mm. (No canines.)

5316. Cebu Market. April 4, 1908. Length, 245 mm. (Canines, upper, 2—2; lower, 1—2.) Body scales greenish above, edged with reddish brown, latter color continuing below, merging into reddish lilac on breast and belly under posterior portion of dorsal; marginal color of scales excessive, giving reddish general hue; caudal peduncle bright bluish green; top of head slate gray; cheek from corner of mouth apple green; elliptical area of same on nose connected with the cheek color by dark green line which runs under eye; green stripe in front of eye and across its top to short dash behind eye; lips pink; central dash of same in green area on nose; two greenish blue chin bands leading backward across throat; numerous spots and dashes on interopercular region. Anal and caudal front and edge broadly blue, body of dorsal orange basally, scales green. Body of anal lilac, base blue. Caudal lobes blue, central area distally apple green, basally blue, scales of base with purplish. Ventral front blue, dash on last ray, centrally body color. Pectoral blue, purplish in upper half. Iris golden. Teeth whitish.

7965. Danawan Island and Si Amil Island. September 27, 1909. Length, 216 mm. (Canines, upper, 1—1; lower, 1—0.) Greenish, each scale of back with pink margin and on side with broad pink base. Yellowish below pectoral. Head smoky brown. Green blotch, edged above with darker, on front part of cheek. Caudal medially light apple green. Anal edge blue, base smoky lavender. Pectoral with blue green and smoky brown.

7546. Endeavor Strait. December 23, 1908. May 20, 1908. Length, 232 mm. (Canines, upper, 1—1; lower, 1—1.)

9174. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 192 mm. (Canines, upper, 2—2; lower, 2—2.)

6356. Jamelo Bay. July 13, 1908. Length, 224 mm. (Canines, upper, 1–2; lower, 1–2.) Teeth white. Top of head orange, bright green with broad band across snout; lips narrowly pale; two green stripes across chin; lower head peach red with blue spots and lines; median throat line continued brokenly to caudal; upper front body color viridian; bases of scales dusky reddish, red dominating below posteriorly. Fins blue. Dorsal with broad orange band medially, narrower one on anal basally. Pectoral with purplish stripe. Ventral salmon, with front and last ray blue.

9005. Langao Point, Luzon. June 24, 1909. Length, 234 mm. (Canines, upper, 1—2; lower, 2—2.)

8306 and 8308. Lode Bay, Destacado Island. March 13, 1909. Length, 235 to 248. (8306, canines, upper, 2—2; lower, 1—2; 8308, canines, upper, 2—2; lower, 1—2.) General color green; upper lip green, with bluish green margins; teeth white; lower lip blue; chin red; isthmus with blue line; green of upper lip

and greenish line across chin extend into cheek, broadening into large green blotch, edged with darker, reaching posteriorly to eye; two or three green lines through eye; top of head smoky purple; margin of dorsal broadly blue, indistinct greenish line through center, remainder of fin reddish; base of caudal smoky purple, upper and lower margins blue, posterior part greenish; anal with broad area of blue at margin, remainder of fin light violet, base blue; pectoral with first two or three rays green, third and fourth rays light violet, remainder of fin becoming lighter toward posterior margin. Rosy spot on middle of side under point of opercle.

5400. Mactan Reef. April 6, 1908. Length, 204 mm. (Canines, upper, 1—1; lower, 1—2.) Bright green on anterior upper side, becoming smoky green on top of head and dusky posteriorly except caudal peduncle, which, again bright green; edges of scales on anterior green area olive with reddish shade, becoming almost geranium red under hinder portion of dorsal; lower surfaces bright heliotrope purple, centers of scales slightly green above; anterior cheek bright emerald green, continued as band across nose about width of pupil; upper lip geranium red; teeth white; green at corner of mouth runs into blue on lower lip; narrow blue band from same area behind and on mesial line of throat; ground of chin and throat geranium red; interopercle with round spots and irregular dashes of green and blue, dash of green in front of upper edge of eye and behind lower corner; two spots on postorbital, and greenish on eyelid; lower cheek and opercle with some orange shades; dash of green on lower hinder edge of opercle; cheek scales with recticulating olivaceous lines; green scales of side showing same. Front and edge of dorsal and anal azure blue; blue continued as stripe for three scales in front of dorsal and from vent to throat as interrupted line. Dorsal base with more or less connected row of bluish green spots, center of fin with orange pink shade anteriorly, obscure row of median spots. Anal base slightly blue, medially lilac purple. Caudal lobes broadly edged china blue, below reddish umber, central rays with reddish dashes basally, and beyond emerald green shading through apple green into yellowish, tips very narrowly dusky. Pectoral china blue, with dark purple area on upper half. Ventral blue in front and on last ray, medially with orange pink shades. Iris golden and dusky.

6148 and 6197. Mansalay, Mindoro. June 4, 1908. Length, 241 to 255 mm. (6197, canines, upper, 1—1; lower, 1—2.)

6533. Maricaban Island Reef. July 21, 1908. Length, 237 mm. (Canines, upper, 1—1; lower, 1—1.) Teeth white. Upper lip red; snout and front of cheek green. Caudal base purplish, yellowish terminally, edges of lobes blue.

12143. Masamat Bay, Quinalasag Island. June 12, 1909. Length, 210 mm. (Canines, upper, 1—2; lower, 0—1.)

5554. Masbate. April 20, 1908. Length, 240 mm. (Canines, upper, 1—0; lower, 2—1.) Anterior side emerald green, scales bordered with geranium red, change to olive on nuchal region; posteriorly reds increase and green limited to narrow bar across scale; posterior portion of caudal peduncle uniform emerald green; lower side red, varying from geranium to orange; top of head olive; lips orange, broad green band from upper lip behind, running across corner of mouth and involving area in front of cheek as far back as eye; short green line at front and upper edge of eye and short dashes of green behind eye; second followed by one or two spots on upper opercle; chin orange; narrow blue band between chin and lip, and an irregular one behind chin, following median line of throat; interopercular region geranium, much dotted with bright blue. Front and margin of dorsal bright blue, running forward two or three scales in median line in front of dorsal, ventral portion of fin orange, few round green blotches, blue or green blotch at bases of spines and rays.

Caudal green centrally, edges of lobes broadly blue, few dashes of dull orange at base; central portion dark green, base yellowish green terminally. Front and terminal two-fifths of anal blue, basal portion dull brick red with orange and purplish shades, blue blotches at bases of rays and last ray of both dorsal and anal bluish. Pectoral antwerp blue, with dull purplish area in upper half, small crescent of same near base. Ventral orange, front and part of last ray apple blue. Iris golden.

6228 and 6229. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 200 to 210 mm. (6228, canines, upper 1—2; lower, 1—1; 6229, canines, upper, 1—1; lower, 1—2.)

4576. Mompog, Anabayan Island. March 3, 1909. Length, 243 mm. Emerald green on tip of nose, front of cheek, caudal peduncle and body of scales above pectoral fin; stripes of same, but darker, at eye, lower part of head, latter becoming blue; middle tip of caudal grass green, outer margin above and below blue; tip of anal blue; spine and first ray of ventral same, and tip of dorsal, latter continued forward as dark median indigo stripe two-thirds of way to eye. Dorsal with middle orange, pinkish on edges forward. Pectoral indigo blue, with purplish red median stripe; scaling from pectoral to caudal peduncle brilliant red, centers with green margins; top of head dark; opercle lighter, with green margins to scales. Lower parts lighter red than sides. Ventrals pale orange, except blue.

4564. Mompog Island, near Marinduque. March 3, 1909. [1209.] Length, 168 mm. (No canines.) Teeth white, lips pale; narrow green band at base of lower lip, another behind chin; band above upper lip running behind mouth corner, below eye, and fuses with chin band; dash of green through upper eye, not reaching across interorbital region; one or two spots behind eye and some on lower head. Body almost uniform green, scale bases reddish. Front dorsal and anal edges, also of caudal lobes, blue; body of dorsal orange blue at base; caudal body yellowish, blue streak basally; anal base blue, front of paired fins blue, purplish stripe in upper half of pectoral.

4577. Same data. Length, 233 mm.

6187. Palag Bay vicinity, Luzon. June 16, 1909. Length, 185 mm. (Canines, upper, 2—2; lower, 1—2.)

23. Pandanon Island. March 23, 1909. Length, 208 mm. (Canines, upper, 2—2; lower, 2—2.)

5910. Parang, Mindanao. May 23, 1908. Length, 222 mm. (Canines, upper, 2—1; lower, 1—1.) Teeth white. Top of head smoky purple to olive; blue in predorsal; back anteriorly green; scales more or less reddish basally, red becoming dominant posteriorly and beneath extended pectoral; cheek green; green across snout; upper lip pink, lower narrowly blue, minutely pink; chin and lower head bright pink, with blue dots and lines; interrupted blue ventral line more or less continued through to vent; caudal peduncle posteriorly green. Dorsal front and margin blue, body of fin pinkish orange, with green median band and base. Caudal indigo, green within fork, somewhat dashed and marked with red. Front and terminal third of anal blue, base and last half ray same, rest lilac. Ventral front blue, rest pinkish. Pectoral blue, purple stripe through upper half. Iris golden.

5884. Polloc. May 22, 1908. Length, 185 mm. (No canines.)

8383. Port Dupon, Leyte Island. March 17, 1909. Length, 209 mm. (Canines, upper, 1—0; lower, 1—2.)

6357. Port Jamelo. July 13, 1908. Length, 243 mm. (Canines, upper, 1—2; lower, 2—1.)

7223 and 7224. Port Matalvi. November 22, 1908. Length, 178 to 200 mm. (7223, canines, upper, 2—1; lower, 2—2; 7224, canines, upper, 2—2; lower, 3—3.) Green above, on cheek, across snout, caudal peduncle, and at caudal

base; lower head and breast purplish, with blue spots and lines. Teeth white. Dorsal base blue, also front and edge, medially orange. Anal similar, but with lilac rather than orange. Caudal with broad blue edges, medially yellowish green, base blue with over shades of purplish, which also form inframarginal stripe in lobes. Pectoral bluish, with purplish stripe through upper half. Ventral front blue.

7402. Port Uson, west side Pinas Island. December 18, 1908. 2 examples. Length, 175 and 205 mm. (Canines, upper, 2—2; lower, 1—1, in both.) Teeth white; top of head slaty purple; blue in front of dorsal, body anteriorly above with greenish ground, posteriorly and below red predominates; caudal peduncle bright green; cheek with green connecting across snout; lips narrowly orange; lower head red, with blue spots and lines. Dorsal front and margin blue, body bright orange, small roundish green blotches across center of spines, becoming obsolete on posterior rays, green at base. Caudal with blue edges to lobes, body of fin yellowish green, with purplish shades at base, and in stripe under blue of lobes. Anal blue and purplish. Ventral front blue. Pectoral blue, with purplish stripe through upper half.

7302. Sablayan, Mindoro. December 12, 1908. Length, 212 mm. (Canines, upper, 2—2; lower, 1—1.) Teeth white; orange upper lip; green nose, and bluish under eye anteriorly, green above; posteriorly and below reddish; dorsal and anal with broad green margins, body orange, blue or green at base; caudal yellowish green centrally; pectoral with purple stripe above center.

6799. Sacol Island. September 9, 1909. Length, 220 mm. (Canines, upper, 2—2; lower, 1—1.) Posterior portion of body bright red, centers of scales with small greenish areas; red confined to bases of scales on side above pectoral, central portion bright green, top of head and anterior back olivaceous; lower part of preorbital and front of cheek bright green; lower head reddish orange with blue stripes and spots. Front and margin of dorsal and anal broadly blue; body of dorsal orange, with round green spot in center of fourth spine to second ray; greenish at bases of rays. Anal blue at base, basal half red, similar to body. Caudal lobes blue edged, hinder portion of fin emerald, base with purple dashes, peduncle bright green. Ventrals orange, with broad blue fronts and dash of blue on last ray. Pectorals blue, with purplish stripe through upper half. Teeth white.

8539. San Fernando, Union Province, Luzon. March 17, 1908. Length, 231 mm. (Canines, upper, 1—2; lower, 1—1.)

5684. Santa Cruz. April 24, 1908. Length, 223 mm. (Canines, upper, 2—2; lower, 1—1.) Top of head purplish olive, becoming purple on snout; teeth white; cheek pale viridian; upper lip narrowly orange, snout emerald above; lower lip, chin, and head geranium, with light blue lines and spots; opercles slightly orange, bordered below with geranium and green; anterior back scales viridian to emerald, bordered with reddish purple, red increasing below; dorsal front and edge blue, body bright orange, green spot centrally; distal half of anal blue, base purple, with blue spots at bases of rays.

A. 782. Sebatic Island. October 1, 1909. Length, 290 mm. (Canines, upper, 2—2; lower, 0—0.)

17667. Sitanki Reef. September 24, 1909. Length, 160 mm. (Canines, upper, 1—1; lower, 1—1.)

5014 to 5018. Surigao, Mindanao. May 8, 1908. Length, 175 to 202 mm. (5014, canines, upper, 1—1; lower, 1—2; 5015, canines, upper, 1—1; lower, 1—2; 5016, canines, upper, 1—2; lower, 1—1; 5017, canines, upper, 1—0; lower, 1—1; 5018, no canines.) (5016.) Bright green, scales margined with reds, varying from very dull olivaceous red on top of head to geranium pink posteriorly; vertical bar of red on each scale from middle of body posteriorly; breast and

adjacent region dull pink, with greenish shades; side of head and opercle orange brown, front of head intricately vermiculated with green and pale scarlet stripes; scarlet showing as three round spots on bluish green upper lip, and second bar behind of broken roundish dots; lower lip bluish, with dull red spot in center; red bar across chin, broken in center by blue; short, irregular green markings on the interopercle and a median green stripe backward to isthmus; opercle with lower edge with green stripe and pink margin. Dorsal with front and tip bright china blue band; scales at bases bright green; center of fin with a series of bright green blotches on membranes, fused across spines on anterior half; above orange, below with more red. Caudal with orange and red lobes, edged blue; tips of rays blue in central portion, blotched with green at base. Anal front and edge broadly banded with azure blue resting on narrow black line; bluish green blotch at base of each ray, partly on scales; body of fin dusky lilac. Ventral straw color, edged bright blue. Pectoral grass green, dusky hyaline terminally, upper edge narrowly greenish blue and dull red stripe on lower edge, indefinitely blotched with purple basally; fin colors continue to axil, which more dusky above. Teeth white. Iris golden and dusky. (5017.) Very dark olive green, with claret wash; dull claret on lower head, breast and belly, showing as vertical bars on bases of all scales on posterior half of body; ventrally borders of scales white; across cheek two or three short dusky purplish bars; lips narrowly geranium red; two dusky stripes across chin enlosing reddish band. Teeth pink at base, white at tips. Dorsal reddish olive centrally, red becoming brighter as indefinite bars above and below; front and margin of fin black. Caudal margin olive green, rays dusky claret. Anal dusky claret, front edge and base blackish. Ventral similar to anal. Pectoral with upper half claret, base and lower half dusky. Iris golden. Another smaller specimen darker, almost purplish black; dusky bars on cheek not distinct.

5799. Tataidaga Point, Pujada Bay, Mindanao. May 15, 1908. Length, 200 mm. (Canines, upper, 1—1; lower, 2—2.)

6460. Tilig Bay. July 15, 1908. Length, 250 mm. (Canines, upper, 2—2; lower, 2—2.) Teeth reddish; general colors green, brightest on anterior back, caudal peduncle and cheek, shaded with red elsewhere; chin and lower head orange, with green stripes and spots; upper lip narrowly orange and back green banded; dorsal orange, with green front and margin, base and last ray, obscure central band of same on front portion; anal similar, but marginal green much deeper; caudal apparently dark blue, inner distal portion paling to yellow; ventral orange, with green front; pectoral green or blue, with orange or purple stripe in upper part.

6476. Same data. Length, 220 mm. (Canines, upper, 2—1; lower, 0—0.)

7672. Ulugan Bay, Palawan Island. December 28, 1908. Length, 186 mm. (Canines, upper, 1—2; lower, 2—2.) Teeth white; front or cheek green; lower head reddish, with blue stripes and spots; middle tip of tail yellowish green.

7705. Same locality. December 29, 1908. Length, 190 mm. (Canines, upper, 2—2; lower, 1—1.) Teeth white; upper lip reddish, with green behind; green under eye and across lower preorbital, continuing into blue chin bands; lower head reddish, with blue spots and lines; dorsal front and margin blue, also base; body orange, with obscure row of greenish dots through center; middle portion of caudal yellowish green; lips blue.

6625. Varadero Bay, Mindoro. July 23, 1908. Length, 260 mm. (Canines, upper, 2—2; lower, 1—2.)

7165. West coast of Palaui Island. November 11, 1908. Length, 207 mm. (Canines, upper, 1—1; lower, 1—1.)

A. 826. Talisse Island. November 9, 1909. Length, 213 mm. (Canines, upper, 1—0; lower, 2—1.)

72718 U.S.N.M. Java. Messrs. Bryant and Palmer. 1 example. Length, 180 mm. As *Pseudoscarus viridis*.

72719 U.S.N.M. Java. Same data as last. 2 examples. Length, 188 to 193 mm.

47548 A.N.S.P. Philippines. Commercial Museum of Philadelphia. Type of *Callyodon philippinus*. Length, 215 mm.

CALLYODON RUBROVIOLACEUS (Bleeker)

Scarus rubroviolaceus Bleeker, Verh. Batav. Genootsch. (Labr.), vol. 22, 1849, p. 52. Batavia.

Pseudoscarus rubroviolaceus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 37, pl. 13, fig. 3 (Java, Buton).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 229 (Moluccas).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 51 (Nias).—Günther, Fishes of Zanzibar, 1865, p. 106 (Zanzibar).—Steindachner, Denks. Akad. Wiss. Wien, vol. 71 (1), 1907, p. 152 (Tamarida, Arabia).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 389 (Karkaralong Islands).

Scarus ruber (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 37. (Name in synonymy.)

Scarus paluca Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1900), p. 60, fig. 18. Honolulu.

Scarus calus Fowler, Journ. Acad. Nat. Sci. Phila., ser. 2, vol. 12, 1904, p. 542, pl. 21, lower fig. Padang, Sumatra.

Callyodon ruberrimus Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 316, fig. 56. Pago Pago, Samoa.

Callyodon upolensis Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 319, fig. 59. Apia, Samoa.

Callyodon macrorhinus (not *Scarus microrhinos* Bleeker) Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 246 (Zamboanga).

Depth 2⅗ to 2¾; head 2¾ to 3⅕, width 2$\frac{1}{10}$ to 2¼. Snout 2⅛ to 2⅞, with convexity forward with age; eye 5 to 8⅙, 1⅘ to 4 in snout, 1⅘ to 3 in interorbital; mouth cleft 3¾ to 5 in head; lips cover ⅔ to ¾ of teeth; canines vary 0 to 2 above each side, usually none below; interorbital 2¾ to 3, convex. Gill rakers 25+33, fine, slender, flexible, short.

Scales in lateral line 18 or 19, 5+2; 1 or 2 scales above lateral line, 6 or 7 below, 7 or 8 predorsal; cheek with 3 rows of scales, lower row as 2 scales on preopercle flange. Scales with 28 or 29 basal radiating striae, edge trilobate; apical striae 25 to 31; circuli very fine.

D. IX, 10, 1, ninth spine 3¼ to 3½ in head, first ray 2⅘ to 3; A. III, 9, 1, third spine 3⅛ to 3⅔, first ray 2⅞ to 3; caudal 1¼ to 1⅓, emarginate, tips moderately exserted; least depth of caudal peduncle 2⅓ to 2½; pectoral 1½ to 1⅔; ventral 1⅞ to 1$\frac{9}{10}$.

Brown generally, more or less uniform. Scales on back and upper sides of trunk usually with 1 to several horizontal darker streaks, bars, or spots. Iris orange buff. Fins all more or less uniform dark brown, sometimes invaded by dark bars and spots of back. Teeth whitish.

Zanzibar and Arabia to the East Indies, Samoa, and Hawaii.

A. 507. Baluk Baluk Island. September 12, 1909. Length, 393 mm. (Canines, upper, 2—2; lower, 0—0.)

10601. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 212 mm. [1774.] General color smoky purplish, fading to gray; when faded specimen on posterior portion of body shows yellowish green shades; darker stripe through each scale, sometimes duplicated and sometimes omitted; snout, lower head, and breast washed with dusky vermilion; dorsal gray, front and margin narrowly slaty, without bars; anal and caudal body color, tipped with dusky; paired fins more or less rosy; pectoral darker, membranes hyaline, with yellowish shades distally below.

9139. Cabugan Island, Chico Island, Leyte. July 30, 1909. Length, 295 mm.

7860. Cagayan, Sulu. January 8, 1909. Length, 439 mm. General color when faded ultramarine ash on back; middle of side slightly more yellowish; lower surfaces pearl gray, with strong salmon to scarlet wash; on scales of upper side and back about four or five stripes of purplish, subdued by overshade of ash; head with more or less smoky purplish shades above; dorsal body color, with red wash posteriorly, fleshy margin of spinous portion pale slaty; caudal and anal similar to posterior dorsal, with strong scarlet red wash; ventrals same; pectorals ash, slightly yellowish on upper portion; iris golden; teeth dusky rose.

8375. Calangaman Island. March 16, 1909. April 22, 1908. Length, 260 mm. Pearly gray; teeth pale rosy; scales of middle of side and posterior half with purplish stripe through each, giving rise to broken stripes along side; fins without bars, of body color, slightly more reddish.

9078. Casogoran, Malhon Island. July 27, 1909. Length, 296 mm. Teeth pale dusky rose; lower head and breast dusky vermilion, becoming paler posteriorly; side olive, with vermilion wash; dash of brown or purplish in center of each scale behind tip of pectoral, more or less irregular, sometimes duplicate, sometimes omitted; fins similar to body, but with more vermilion wash; margins or tips slaty in vertical fins.

5319 Cebu market. April 4, 1908. Length, 252 mm. Reddish olive, scales edged narrowly with darker; darker blotch in center, giving rise to interrupted stripes, becoming red on lower surface; upper lip reddish, lower pale; teeth reddish; dorsal body color, edged with darker; anal color of adjacent body; caudal same; ventrals red; pectoral reddish above and basally, hyaline below distally; iris golden.

A. 594 and A. 595. Gondra Island. September 20, 1909. Length, 385 to 438 mm. (A. 594, canines, upper, 2—1; lower, 0—0; A. 595, canines, upper, 1—2; lower, 0—0.)

8876. Palag Bay vicinity, Luzon. June 16, 1909. Length, 495 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 7315. Sablayan Bay, Mindoro. December 12, 1908. Length, 345 mm. (Canines, upper, 0—1; lower, 0—0.)

6915. Santo Domingo, Batan. November 7, 1908. Length, 553 mm. (Canines, upper, 1—2; lower, 0—0.) Teeth rosy, white at tips; general color with rosy shades, very dark above; dark showing as irregular stripes on scales on sides and below; dorsal similar to body but more red, no bars; caudal and lower fins quite red, without bars or markings; lower terminal portion of pectoral hyaline; iris with golden.

5218. Siasi Island market. February 17, 1908. Length, 201 mm. [125.] General ground color light heliotrope purple, margins of scales above darker; indistinct bars of yellowish cast on under half of body; anterior and lower part of head, breast, and belly with vermilion shades; interorbital region

slightly darker. Teeth pink. Dorsal mottled with maroon and light. Caudal dull purplish maroon. Anal similar to dorsal, paler and reds brighter. Ventral lilac, with dashes of vermilion, possibly entirely vermilion in life. Pectorals hyaline terminally, light reddish brown area on upper rays and across base, dark blotch across upper part of base above. Iris golden.

19077. Silino Island. August 10, 1909. Length, 209 mm. [1811.] Head and anterior body with wine red wash, body otherwise gray, scales marked by somewhat darker line above and posteriorly; fins without bars, caudal edged dusky; ventrals reddish; pectorals brownish at upper tip.

A. 618. Simaluc Island. September 22, 1909. Length, 232 mm. Dorsal on fading shows slight mottling of whitish; ventrals tipped with pale crimson, probably almost wholly so in life; pectoral purplish at base and above, hyaline terminally, with slight yellow shade.

A. 746. Sipadan Island. September 29, 1909. Length, 424 mm. (Canines, upper, 1—0; lower, 0—0.)

6473. Tilig Bay, Lubang Island. July 15, 1908. Length, 287 mm. White teeth; general color dusky orange, with four or five interrupted blue saddles extending almost to ventral line; blue interorbital band, another across nose, and another behind chin; one from below corner of mouth to under eye, with broken blue behind and above eye; fins body color; dorsal and anal with blue margins; caudal lobes with blue edges; first ray of pectoral blue.

6993. West coast of Sabtan Island. November 9, 1908. Length, 215 mm. General color olivaceous with reddish shades most prominent in fins and in anterior and lower surfaces. Teeth slightly rosy. Few dark spots on back irregularly, one to each scale.

6986. Same data. Length, 506. (Canines, upper, 1—2; lower, 0—0.) General color brownish, with reddish shade. Back and sides with short, broken bars and dots on scales darker brown. Anterior head and lower surfaces reddish, brighter in lower fins. All fins with reddish shades. Dorsal slightly margined with slaty, rest of fins without markings. Lower terminal portion of pectoral hyaline. Teeth white. Iris orange.

5936. Zamboanga market. May 25, 1908. Length, 362 mm. (Canines, upper, 2—1; lower, 0—0.)

A. 970. Binang Unang Island, Dutch East Indies. November 17, 1909. Length, 250 mm.

A. 971 and A. 972. Binang Unang Island. November 18, 1909. Length, 272 to 278 mm. (A. 971, canines, upper, 1—2; lower, 0—0; A. 972, canines, upper, 1—2; lower, 0—0.)

A. 1500. Birabirahan Island, Borneo. December 31, 1909. Length, 367 mm. (Canines, upper, 1—2; lower, 0—0.)

A. 857. Limbe Strait, Celebes. November 9, 1909. Length, 500 mm. (Canines, upper, 1—1; lower, 0—0.)

A. 1443 and A. 1449. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 233 to 330 mm. (A. 1443, canines, upper 1—1; lower, 0—0.)

A. 1444. Kait Point. December 31, 1909. Length, 378 mm. (Canines, upper, 1—2; lower, 0—0.)

51749 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. Type of *Callyodon ruberrimus*.

58027 U.S.N.M. Zamboanga. Dr. E. A. Mearns. 1 example. Length, 330 mm. As *Callyodon macrorhinus*.

62368 U.S.N.M. Honolulu. Bureau of Fisheries. 1 example. Length, 138 mm. As *Callyodon paluca*.

51751 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Type of *Callyodon upolensis*.

CALLYODON VERMICULATUS, new species

Depth 2⅔ to 2⅗, head 2⅘ to 2⅞, width 2⅛ to 2¼. Snout 2⅛; eye 7⅙ to 7⅕, 3¼ to 3⅓ in snout, 2¼ to 2⅗ in interorbital; mouth cleft 4 to 4¼ in head; lips cover ⅔ to ¾ of teeth; canines small, 1 to 3 above, none below; interorbital 2⅘ to 2⅞ in head, broadly convex. Gill rakers 20+30, slender, short, flexible.

Scales in lateral line 19+5+2; 2 scales above lateral line, 6 below, 7 predorsal; cheek with 3 rows of scales, of which lowest with 3 scales on preopercle flange. Scales with 22 to 30 basal radiating striae, 39 to 40 apical; circuli fine.

D. IX, 10, 1, ninth spine 3⅗ to 3⅘ in head, first ray 2⅘ to 2⅚; A. III, 9, 1, third spine 3⅛ to 3¾, second ray 2⅗; caudal 1¼ to 1⅓, concave behind, ends little exserted, in young hind caudal edge slightly convex; least depth of caudal peduncle 2⅛ to 2¼; pectoral 1⅓ to 2⅛; ventral 1⅘ to $1\frac{9}{10}$.

Upper half of head until level with lower eye edge, all of trunk and front of tail to beginning of lower section of lateral line dark brown, with rather longitudinal fine darker vermiculating lines or streaks. Eye with 2 short yellow bars forward and 2 behind. Yellow bar around upper lip, 1 around lower lip, and another across chin. Iris brown. Lower half of head pale brown, with traces of obscure vermiculations. Teeth whitish. Caudal peduncle and hind portion of tail and caudal fin light brown, with grayish basally and on upper and lower lobes medially. Dorsals and anals grayish, edges brownish. Pectoral pale brown, end of fin deep brown. Ventral dull brown, with greenish line along front edge submarginally.

East Indian region. A very distinct species, known by its striking color pattern, with pale head and caudal, the rest of the body dark. Our smallest example is more variegated than any of the others, having a more mottled appearance. The lower half of the head is darker than that of the adults, also mottled, and not so contrasted with the upper half. Dorsals and anals basally with oblique dark blotches and waved bars.

Type.—Cat. No. 89978, U.S.N.M.

15575. Bugsuk Island, Balabac. January 5, 1909. Length, 130 mm.

10598. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. [1773.] Length, 210 mm. General shade dusky rose; scales apparently with olive stripe through each row, which faded, paler interval between rows distinctly apparent; scales of side of abdomen with darker bases and gray margins after fading; dorsal rose, with dark front and margin and oblique downward and backward directed bars crossing about three or four membranes, most distinct on anterior portion of fin; caudal and anal rose, tipped slightly dusky, also edge of caudal lobes very narrowly; paired fins rose; pectoral membranes hyaline, first ray dusky; iris golden; teeth white or with very slight greenish tinge.

A. 732. Danawan Island. September 27, 1909. Length, 290 mm. (Canines, upper, 1—1; lower, 0—0.)

1152. Porongpong Island. June 11, 1909. Length, 265 mm. (Canines, upper, 2—3; lower, 0—0.)

A. 535. Tambul Sigambul. September 15, 1909. Length, 238 mm.

A. 1151. Gane Road, Gillolo Island, Moluccas, Dutch East Indies. December 1, 1909. Length, 237 mm. Head and back rosy brown; scale rows on side with broad wash of brown forming stripe through each, large scales behind pectoral with violet black, somewhat crescentic base bar and margin pale, closely veined with brownish; caudal peduncle pale pink, abruptly separated from brown ground color of side; fins plain vermilion; dorsal with very narrow darker margin.

A. 1046. Tidore Island, south of Ternate. November 24, 1909. Length, 268 mm. (Canines, upper, 2—2; lower, 0—0.) Side of head, along base of dorsal and caudal peduncle viridian, rather emerald on back; ground color of top of head and entire side and back, except as mentioned, dull greenish, much mottled and vermiculated with dusky orange; teeth bluish; upper lip dusky orange; snout broadly green, running into green of cheek, above bronzy orange bar limits colored area of top of head; two dusky orange bars across chin, very narrow orange margin on lower lip; lower side of head and breast with obscure reddish mottling, similar to that of side, but not so pronounced. Dorsal blue above and below, middle occupied by broad dusky orange bar with few blue hieroglyphics in its central region, base of last three rays green. Caudal green, edges of lobes narrowly blue and crescent of dusky orange or purplish, central portion occupying terminal scales (last two rows), horns extending to tip of lobes. Anal largely slaty, with orange shade, front and margin blue, last ray green and few blue areas at bases of rays under scaled sheath. Ventrals largely blue, dashes of slaty or purplish in centers. Pectoral bright green, dull purplish or slaty bar through upper half and some of the spots encroaching on scaled base. Iris colored with reddish stripes invading.

(*Vermiculatus*, vermiculate or with wormlike markings.)

CALLYODON DUBIUS (Bennett)

Scarus dubius Bennett, Zool. Journ., vol. 4, 1828, p. 37. Hawaiian Islands.

Pseudoscarus dubius Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 229 (type, Fiji); Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 313 (type, East Indies, Tahiti, Raiatea, Samoa, Marquesas Islands, Fiji).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 386 (Makassar, Salibabu, Banda, Aru Islands).

Callyodon dubius Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, p. 1, 1903 (1905), p. 350 (Honolulu).—Seale, Philippine Journ. Sci., vol. 9, 1914, p. 70 (Hong Kong).

Scarus lacerta Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 217. Pondichery.

Pseudoscarus lacerta Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 33 (types).

Callyodon lacerta Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 319 (Samoa); Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 31 (Iloilo).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 96 (Bulan and Bacon.)

Scarus aeruginosus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 257. Red Sea.

Pseudoscarus aeruginosus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1865, p. 40, pl. 17, fig. 2 (Java, Sumatra, Batu, Singapore, Biliton, Celebes, Halmaheira, Ternate, Timor, Ceram).—Günther, Cat. Fish. Brit. Mus., vol. 4,

1862, p. 229 (East Indies).—Kner, Reise Novara, Fisch., vol. 2, 1865, p. 261 (Manila, Singapore, Tahiti, Auckland).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 51 (Batavia, Mauritius, Red Sea).—Day, Fishes of India, pt. 3, 1877, p. 412, pl. 89, fig. 3 (Andamans).—Bleeker, Verh. Akad. Wet. Amsterdam, vol. 18, No. 3, 1879, p. 1 (Mauritius).—Károli, Termesez. Füzetek, Budapest, vol. 5, 1881, p. 175 (Singapore, Yokohama, Java).—Day, Fauna Brit. India, vol. 2, 1889, p. 425.—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 559 (Luzon, Cavite, Santa Cruz, Batangas, Nasigbu).

Scarus bennetti Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 270. Hawaiian Islands.—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), pl. 45.

Scarus lividus (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 40 (name in synonymy).

Pseudoscarus augustinus Kossmann and Räuber, Zool. Ergebn. K. Acad. Wiss. Berlin, vol. 1, 1877, p. 27. Red Sea.

Pseudoscarus knerii Steindachner, Sitzs. Akad. Wiss. Wien, vol. 96 (1), 1887, p. 64, pl. 4, fig. 1–*a*. Auckland and Indian Ocean (Madagascar?).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 386 (Karkaralong Island).

Callyodon muricatus (not Valenciennes) Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).

Callyodon erythrodon (not Valenciennes) Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 317 (Samoa).

Callyodon balinensis (not Bleeker) Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 320 (Apia).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 51 (Zamboanga).

Depth 2⅖ to 2¾; head 2⅘ to 3, width 2 to 2¼. Snout 2¼ to 2⅓; eye 6 to 7¼, 2½ to 3¼ in snout, 2 to 2⅔ in interorbital; mouth cleft 3⅗ to 4⅓ in head; lips largely cover teeth; canines usually absent, sometimes 1 to 3 above each side, and 1 below each side; interorbital 2⅞ to 3⅕, convex. Gill rakers 18 +22, flexible, slender, short.

Scales in lateral line 18 to 20, 4 or 5+2; 2 scales above lateral line, 6 below, 6 predorsal; usually 3 rows of cheek scales, of which lowest row usually as 2 scales on preopercle flange and usually separated by interspace, rarely single scale and rarely preopercle flange scaleless. Scales with 25 to 34 basal radiating striae; apical 32 to 37; circuli very fine.

D. IX, 10, I, ninth spine 3 to 3⅛ in head, first ray 2⅖ to 3; A. III, 9, I, third spine 3⅓ to 3⅘, first ray 3 to 3⅕; caudal 1½ to 1⅔, truncate, little convex behind as expanded; least depth of caudal peduncle 2¼ to 2⅖; pectoral 1⅓ to 1½; ventral 1⅘ to 2.

Dull brown generally, sometimes with reddish tints. Usually along side of abdomen 3 lower rows of scales each with median white streak from head to anal. Fins all pale brown.

Mauritius to the East Indies, China, Hawaii, and Tahiti. We follow Günther in the definition of this species, as he has compared the type of the species with Bleeker's East Indian examples of *Pseudoscarus aeruginosus*. In the original descriptions of both *Scarus lacerta* and *Scarus aeruginosus* the three white longitudinal

abdominal streaks, usually so characteristic of the species, are not mentioned. This may be due either to their absence in life or their having faded in preservation. The ample lips, largely or quite covering the teeth and the usual absence of hind canines, together with the presence in most cases of three rows of scales on the cheek, will usually serve to distinguish the species. In our large series are a number of uniformly colored examples, with the above combinations, which we place here. In all cases we give the canines where present, also the scales on the preopercle flange where they vary from two on each side of the head.

11105. Agojo Point, Catanduanes Island. June 10, 1909. (No canines.)

5052 and 5053. Alibijaban Island, Ragay Gulf, Luzon. Length, 112 to 242 mm. [1230 and 1231.] Teeth white; chin clear gray, top of head, especially interorbital region, with yellowish olive shades; no markings on fins.

8078. Alimango Bay, Burias Island. March 5, 1909. Length, 232 mm. (Canines, upper, 0—1; lower, 0—0.)

11197 and 14886. Alimango Bay, Burias Island. March 15, 1909. Length, 157 to 162 mm. [1216 and 1214.] Teeth white; upper portions olive, lower pale, with reddish; vertical fins more or less reddish, anal most clear; dorsal with slightly slaty border; pectorals slightly yellowish, darker across base; no median bars on any of fins.

8917 and 8928, 15261. Atulayan Island, Lagonoy Gulf. June 18, 1909. Length, 216 to 252 mm. (8928, canines, upper, 2—2; lower, 0—0.)

17756 and 17757. Balikias Bay, Lubang Island. July 17, 1908. Length, 153 to 160 mm.

16806, 16807, 16809. Butauanan Island. June 12, 1909. Length, 120 to 188 mm. (16807, preopercle 1—1.)

18728 to 18730. Butauanan Island. June 13, 1909. Length, 133 to 143 mm. (16728, preopercle 3—1; 16730, preopercle 1—2.)

16357. Biri Channel, Balicuatro Island. June 1, 1909. Length, 142 mm. (Preopercle 2—3.) Ground color slightly pale, without vermilion anteriorly; lower surface somewhat dusky rosy. Slaty bar across chin; teeth white, tip of caudal yellowish green. No appearance of pale caudal peduncle and its blotch.

8628. Same data. Length, 252 mm. (Preopercle 1—2.)

9945 and 12118. Biri Channel. June 2, 1909. Length, 195 to 216 mm. [1565.] General color gray; caudal regions yellowish; teeth white; lower lip chin band and throat line blue, with dash of blue on interopercle; top of head bluish, with reddish specks or small mottlings; front and margin of dorsal and anal pale blue, body of fin somewhat yellowish, with submarginal and basal band of reddish shade; anal without bars; ventrals fronts blue; pectorals plain dusky.

14506. Biri Channel. June 21, 1909. Length, 227 mm.

8658 and 8660. Biri Channel. June 22, 1909. Length, 178 to 217 mm.

12400. Bolalo Bay, Palawan Island. December 21, 1908. [959.] Olive, centers of scales reticulated with dusky; top of head and nose plain; teeth white; lower portions washed with pale scarlet, becoming purplish posteriorly; dorsal with bronzy shades; front and margin narrowly very pale slate, no other markings; caudal dusky, with dull purplish wash; anal pale hyaline purplish; ventrals similar, but paler; pectorals hyaline, upper half almost body color.

7460. Same data. Ochraceous to orange with blue saddles and stripes on head; teeth very pale rose.

8332. Buang Bay, Talajit Island. March 15, 1909. (Canines, upper, 1—1; lower, 0—0; preopercle, 1—1.) Teeth white; top of head olive gray; back similar, but paler; dorsal with dull slaty front and margin, body of fin reddish, with dashes of green on spinous rays and anterior soft membranes; caudal smoky purplish; anal pale; ventrals same; pectorals hyaline lemon yellow, most pronounced at base and upper portion; abdominal region with three pale stripes; somewhat dusky at upper base of pectoral.

8337. Same data. (Canines, upper, 2—2; lower, 1—0.) Teeth white; general color gray, with marked olive overshade, most pronounced on head; whitish stripes on abdominal region; fins unmarked; differs in extreme length of upper lip, which overhangs not only jaws but part of lower lip; slight reddish wash on breast and ventrals.

8338. Same data. (Preopercle, 1—2.) Teeth white; general colors gray and olive; no marks on fins, whitish stripes showing on abdominal region.

8339. Same data. (Preopercle, 2—1.) Teeth indigo; upper lip orange, somewhat purplish shade; lower lip very narrowly purple, behind which bright blue, becoming green at corner of mouth; broad viridian band crosses snout, passes backward under eye, and obscurely along opercle to below its point, just below base of pectoral; short dash of green across eyeball, above and in front; top of head olivaceous, continuing backward on nuchal region; sides green, with magenta margins to scales on central portion; distinct green stripe curves from base of pectoral toward abdominal contour, thence somewhat above base of anal to lower portion of caudal peduncle, separating somewhat purplish green color, also portions of body from greenish and reddish above; front and margin of dorsal blue; base tambien, body orange red; caudal green, becoming purplish at tip, with broad purplish-orange stripe through each lobe; anal broadly blue on front, margin and base, body orange red; ventrals blue; pectorals greenish.

11631 and 15574. Bugsuk Island, Balabac. January 5, 1909. Length, 75 to 172 mm.

9978, 15179. Busin Harbor, Burias Island. March 7, 1909. Length, 169 to 217 mm.

7100, 7198, 9973 to 9977, 171. Same locality. March 8, 1909. Length, 125 to 191 mm. (9975, canines, upper, 0—1; lower, 0—0; preopercle, 0—1.) [1247.] Teeth white; general color olivaceous, with indistinct reddish brown shade; dorsal very pale slaty at margin, under which pale reddish bar and a similar reddish bar at base, central portion of fin olivaceous; caudal near body color but with somewhat purplish shades; anal and ventrals pale, with slight reddish wash; pectorals distinctly yellow at bases, becoming hyaline through fin proper; obscure slaty bar behind chin; lower head and body more reddish than above.

5663. Busin Harbor. March 23, 1908. Length, 253 mm. (Canines, upper, 2—0; lower, 0—0.) Emerald on back, becoming bluish lower or above pectoral, with slaty and pink shades on breast; scales narrowly edged with reddish and slate anteriorly, becoming brighter on middle of body, posteriorly changing to reddish bars at bases of scales; top of head more or less slaty or olivaceous; narrow irregular green lines about edges of scales and across interorbital region; snout geranium red, continued on preorbital till under eye; many vermiculating viridian lines; short similar lines radiating from eye; red spot at middle of each lip; upper lip otherwise beryl; geranium band behind, and viridian behind still posterior; lower lip pale blue, color projected backward over chin; blue throat line; interopercular region alternately bluish red and green; subopercle with reddish margin and greenish inframarginal band; cheek and lower opercle with orange shades; teeth white. Dorsal front and

margin narrowly antwerp blue, except the last two rays; base under scales green, body of fin orange changing to purple below posteriorly; large emerald blotch on each membrane. Edges of caudal blue; central portion of fin orange, with terminal dash of blue, greenish basally. Front and edge of anal blue, base greenish under scales, fin generally purplish, becoming orange under blue. Ventral dull orange, front blue. Pectoral emerald, with narrow purplish stripe in upper half, upper ray tipped blue and rest of rays tipped hyaline. Iris dusky golden.

5610 to 5613, 7481. Busin Harbor. April 22, 1908. Length, 153 to 188 mm. (5610, preopercle 2—1; 5611, preopercle, 1—2; 5613, canines, upper, 1—1; lower, 1—1; 7481, canines, upper, 0—0; lower, 1—1; preopercle, 0—1.)

5646, 5647, 5654, 5655. Busin Bay, Burias Island. April 23, 1908. Length, 177 to 208 mm. Grayish olive above, becoming pinkish gray below; on lower side and belly centers of scales opaque, giving rise to about three obscure lines; teeth white, very pale rosy at base in smaller specimens; dorsal about body color, very narrowly margined slaty; caudal body color or slightly more of claret shade; anal with claret shades, pale; ventral same; pectoral dusky, somewhat orange, not marked in other two; iris golden; orbit in one greenish, with blue shades above.

5656, 5659. Busin Harbor. April 23, 1908. Length 179 to 215 mm. (5659, preopercle, 2—3.)

5675, 10596, 11137, 11138, 11142. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 147 to 198 mm. (5675, preopercle, 0—0; 10596, preopercle 0—0, [1772]; 11137, preopercle 0—0 [1764]; 11138, preopercle 0—0; 11142, canines, upper, 1—1; lower, 0—0; preopercle 1—0 [1770].)

7864 and 7865. Cagayan, Sulu. January 8, 1909. (7865, preopercle scales 1—1.) General color gray with more or less brassy wash on head and back; lower surfaces pale, with still lighter areas in center of scales showing as three stripes on lower side; fins without definite markings, somewhat reddish; teeth white.

18995. Same locality. June 8, 1909. Length, 190 mm.

21632. Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 224 mm.

9753. Camp Overton, Mindanao. August 6, 1909. Length, 135 mm.

7777. Candaraman Island, Balabac. January 4, 1909. Length, 230 mm. Teeth dusky rose. Body and head gray, without bars on fins.

8712. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 155 mm.

5536. Cataingan Bay, Masbate. April 17, 1908. Length, 187 mm. (Preopercle, 0—1.) Teeth white; upper portions olivaceous, middle of side washed yellow; lips pale; chin with reddish band; dorsal front and tip slaty, center greenish above and below with reddish bands, becoming diffuse posteriorly; caudal purplish, lower fins pink; anal white terminally; pectoral pale yellow.

13021. Cataingan Bay, near ship anchor, Masbate. April 17, 1908. Length, 130 mm.

16855. Cataingan Bay. April 18, 1908. Length, 98 mm.

10696. Cataingan Bay, Dumurug Point. April 19, 1908. Length, 190 mm.

8273, 11183, 11190, 17476, 17477, 22594. Canmahala Bay, Ragay Island. March 11, 1909. Length, 49 to 229 mm. (8273, preopercle 1—2; 11190 [1215]; 17476, preopercle, 1—2 [1314]; 17477 [1313]; 22594, preopercle, 1—1.) [1213.] Teeth dusky rose; head and anterior body olive gray, with reddish shades; top of head darker; chin and snout with blue bars; caudal peduncle and fin yellow; front and margin of dorsal and anal blue, body of dorsal orange, becoming yellow posteriorly, including all of last three rays; anal margin

much broader, basal portion whitish or orange; ventrals blue, other rays pale or reddish; pectoral very pale straw, black blotch in upper base.

5312. Cebu market. April 4, 1908. Nearly uniform orange, lighter below. Vertical fins like body. Light shade of orange on dorsal and caudal, more purplish on anal. Dorsal front and tip dusky. Ventrals purplish. Pectorals dusky. Teeth very pale rosy. Iris golden, lid bluish above.

7573. Same locality. April 6, 1908.

6765 to 6774. Chase Head, beach at village near Endeavor Strait. December 22, 1908. Length, 59 to 133 mm. (6771, preopercle, 1—2; 6773, preopercle 0—0; 6774, preopercle, 3—1.)

17721. Cuyo Island. April 9, 1909. Length, 185 mm.

17086 and 17087. Dupon Port, Leyte. March 17, 1909. Length, 136 to 160 mm. (17086, preopercle, 1—1; 17087, preopercle, 1—0.)

7546. Endeavor Strait, Malampaya Sound, Palawan Island. December 23, 1908. Length, 233 mm. Teeth white; top of head olive; back and caudal peduncle green; posterior body with reddish shades; front of cheek green; lower head red, with blue spots; dorsal front and margin blue, base green, body of fin orange; on third and following spines small roundish green blotches; edge of caudal blue, middle of fin yellowish green, base with purplish shades.

7578. Same data. Body gray. Teeth dusky rosy. No bars on fins.

7579. Same data. Teeth white. Same as above.

1 example, Endeavor Strait, north end at northwest coast of Palawan. December 22, 1908. Length, 55 mm.

7500. Same locality. December 22, 1908. Teeth dusky rose. Lips and chin band red. General color claret brown.

7501. Same data. Teeth white. General colors yellow, with blue bars.

7510. Same data. Teeth pale rosy. Gray. No bars on fins.

15462. Galera Bay, Mindoro. June 9, 1908. Length, 190 mm.

6801, 7379, 7380, 7382, 9171, 9172, 9173, 9175. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 106 to 250 mm. (6801[1727]; 7380, preopercle, 1—1; 9175, preopercle, 1—1[1726].) [1727.] Top of head and back gray, with darker venations through scales; chin and forehead with greenish wash; breast and belly gray, with vermilion wash; dorsal reddish brown on olive, front and margin narrowly slaty; caudal similar, but with less red; lower fins dusky vermilion; anal with very narrow slaty margin; pectorals dusky hyaline more or less vermilion at bases, extreme tip slightly orange. [1726.] Side of head and body gray, back slightly olive; snout and front of top of head with green shades, more or less mottled with orange brown through interorbital region; throat and breast bright blue wash; belly with pale salmon shades; teeth dusky white; lower lip blue; two reddish bands across chin, first passing through corner of mouth by preorbital to eye. Dorsal orange at base, yellowish green through center, with somewhat orange shades again immediately under indigo front and margin; last three rays without blue. Caudal lemon yellow, edges of lobes bluish, tip dusky and white. Anal with reddish shades, front and margin bright blue, some blue along base. Ventral fronts blue, also last three rays, first two rays with reddish shades. Pectoral rays somewhat dusky, membranes hyaline, fin with slight straw orange tone, blackish at base of upper ray.

4582. Grande Island Reef, Subig Bay. January 8, 1908. Length, 205 mm. (Canines, upper, 1—1; lower, 1—1; preopercle, 1—1.)

9256. Inamucan Bay. August 8, 1909. Length, 218 mm. (Preopercle, 2—4.)

9258. Same locality. August 9, 1909. Length, 242 mm. (Preopercle, 1—3.)

4807. Jolo market, Jolo. February 8, 1908. Length, 240 mm. (Preopercle, 1—2.)

4861. Jolo market. February 13, 1908. Length, 250 mm. (Preopercle, 1—2.)

5175. Jolo. March 7, 1908. Length, 214 mm. (Preopercle, 0—0.) General color olive, pale below. No stripes or lines on chin. Teeth almost white, very pale pink basally, with tinge of claret. Ventrals and anals with reddish shade.

5177. Same data. Similar to above. Length, 270 mm.

5179. Same data. Teeth more exposed. Length, 217 mm. (Preopercle, 2—1.)

5180. Same data. Length, 222 mm.

5181. Same data. Somewhat darker, scales with apparent dark longitudinal hair line. Caudal somewhat lunate, narrowly tipped white in emargination. Length, 205 mm. (Canines, upper, 1—1; lower 0—0; preopercle, 0—0.)

5182. Same data. Iris golden, same in all above. Length, 174 mm.

5183. Same data. Length, 199 mm. (Canines, upper, 1—1; lower, 0—0.)

4922. Same data. Length, 188 mm. (Preopercle, 2—4.) Body gray, fins with more reddish. Teeth white.

23718. Same locality. March 6, 1908. Length, 131 mm. (Preopercle, 2—1.)

13039. Kayoa Island. November 29, 1909. Length, 172 mm.

5732. La General Island, Capunuypugan. May 9, 1908. Length, 260 mm. (Preopercle, 1—2.)

146, 147, 8997, 9006, 9010, 9011. Langao Point, Luzon. June 24, 1909. Length, 140 to 240 mm. (9011, preopercle, 2—1.)

8758. Lahuy Island. June 11, 1909. Length, 276 mm.

14353. Limbones Cove. February 8, 1909. Length, 170 mm. [1134.]

11978 and 11984. Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 134 to 150 mm.

5961. Little Santa Cruz Island. May 26, 1908. Length, 188 mm. (Preopercle scaleless.) Teeth whitish. Bars at scale bases reddish. No reddish on lips. Iris silvery. Dorsals with brick red shade through fin body, paler area on center of membranes.

8309. Lode Bay, Destacado Island. March 13, 1909. Length, 258 mm. (Canines, upper, 1—1; lower, 1—0.) General color deep smoky; head with dusky greenish shade; margin of dorsal dark smoky over a dusky reddish, translucent band, remainder of dorsal light slate; upper and lower margins of caudal dark, lobe with dusky greenish shades; anal margin dusky greenish, remainder of fin rosaceous; ventral dusky reddish.

10946 to 10953, 17401, 16966, 18757 to 18763, 19154. Lode Bay, Destacado Island. March 13, 1909. Length, 159 to 218 mm. (10946, preopercle, 0—2; 10951, preopercle, 1—1; 18757, canines, upper, 0—1; lower, 0—0; preopercle, 1—1 [1347]; 18758 [1345]; 18759, preopercle, 2—1 [1348]; 18760, canines, upper, 2—1; lower, 1—1; preopercle, 1—1 [1343]; 18761 [1349]; 18762, preopercle, 1—1 [1344]; 18763 [1342]; 19154, preopercle, 1—0; 17401[1346].) [1344.] Lips green; chin band and isthmus blue; dorsal dusky blue, margin dusky, green median band, dusky red above and below greenish central band; caudal dusky yellow, very narrow upper and lower green margins; anal with outer half blue, lower half light violet; small spot in axil of pectoral, anterior rays smoky, posterior part hyaline; ventral spines green, remainder of fin greenish white. [1343–49.] General color olivaceous, lighter on lower head and breast; three or four whitish stripes on side of belly; dorsal with dusky margin over a reddish line, caudal immaculate, dark at tip; anal immaculate, rays faded; pectoral yellowish; ventrals light rosy.

8944 to 8946. Mabul Island. September 22, 1909. Length, 218 to 250 mm. (8945, preopercle, 1—2; 8946, preopercle, 1—2.)

11236. Mactan Island, Cebu. March 25, 1909. Length, 163 mm. (Preopercle, 1—1.)

8817, 14690. Maculabo Bay. June 13, 1909. Length, 200 to 272 mm.

14555 to 14561, 14572, 14573, 14576, 14577, 16714, 16731. Maculabo Island. June 14, 1909. Length, 122 to 247 mm. (14556, preopercle, 1—2; 14557, preopercle, 2—1; 14558, preopercle 2—1; 16731, preopercle, 2—2.)

6448. Mahinog, Camiguin, Island. August 3, 1909. Length, 194 mm.

12157 and 12159. Malcochin Harbor. December 19, 1909. Length, 157 to 201 mm. [936, 934.]

12526. Same data. Length, 223 mm. [933.]

6198. Mansalay Island, Mindoro. June 4, 1908. Length, 213 mm. (Canines, upper, 0—0; lower, 0—1; preopercle, 0—0.)

1 example. Mansalay Island. June 4, 1908. Length, 60 mm. (Preopercle, 2—2.)

16616. Maribojoc Bay, Bohol Island. March 26, 1909. Length, 200 mm. [1480.] Teeth white; general color gray; edges of scales slightly brownish; green band across snout under eye to point of opercle; lower lip blue, blue green band behind chin; blue stripe along throat and median ventral region; interorbital region olivaceous, becoming smoky purplish anteriorly; front of head below rather lilac pink; front and margin of dorsal slaty blue, band of green through center breaking into spots on membranes posteriorly and becoming obsolete on last portion of fin; above orange and below heliotrope purple; caudal dusky purple, edges of lobes slaty and stripe through middle of lobes bright; front margin and base of anal very pale sky blue, middle portion pale purplish; ventrals similar to anal, paler; pectorals bright lemon yellow, dusky blotch on upper base.

5573. Masbate Reef. April 20, 1908. Length, 183 mm. Pale olivaceous. Teeth rosy.

5559. Same data. Length, 183 mm. Teeth rosy. Lips pale. Chin band reddish.

5564. Same data. Length, 230 mm. (Preopercle, 3—2.) Green, without vertical bars posteriorly. Cheek slaty. Upper lip pale, green line above. Teeth rosy.

9342. Matnog Bay. May 3, 1909. Length, 130 mm.

9339 and 9340. Matnog Bay. May 31, 1909. Length, 142 to 150 mm.

8046. Mompog Island, near Marinduque. March 3, 1909. Length, 250 mm. (Preopercle, 1—2.) [1205.] Head and upper part of body olive, lower portions rosy; whitish stripe through two or three lower rows of scales shows more or less distinctly; vertical fins about body clear, some more red; margin of dorsal not distinctly marked, nor any bars on any of vertical fins; ventrals reddish; pectorals dusky olive, slightly darker in upper base, but not with distinct blotch; teeth white.

4565, 17443. Mompog Island, Anabayas Island. March 3, 1909. Length, 130 to 203 mm. (17443 [1265].)

9273 to 9275, 17451. Murcielagos Bay, Mindanao. August 9, 1909. Length, 160 to 184 mm. (9274, preopercle, 1—1; 9275, preopercle, 1—2.)

8964 and 8967. Same locality. August 20, 1909. Length, 154 to 176 mm. (8964, canines, upper, 1—1; lower, 0—1.)

19864 and 19866. Nabatas Point, Samar. July 24, 1909. Length, 132 to 162 mm.

7956, 12463. Pagapas Bay, Luzon. February 20, 1909. Length, 90 to 247 mm. (12463, canines, upper, 0—1; lower, 0—0.)

8893, 17320, 15254. Palag Bay vicinity, Luzon. June 16, 1909. Length, 126 to 253 mm. (8893, preopercle, 2—1.)

7116, 7346, 7347. Palaui Island, west coast. November 18, 1908. Length, 185 to 213 mm.

5950 and 5952. Panabutan Bay, Mindanao. February 6, 1908. Length, 105 to 178 mm.

8426. Pandanon Island. March 24, 1909. Length, 230 mm. Back olive gray. Belly pale, with slight reddish wash. Fins slightly red, uniform. Teeth white.

17262. Pandanon Island. March 24, 1909. Length, 73 mm. (Preopercle, 0—0.)

14649. Parang, Mindanao. March 23, 1908. Length, 177 mm.

7350. Tara Island. December 14, 1908.

12869 and 21015. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 175 to 192 mm.

1 example, Philippines. Length, 215 mm.

1 example, Philippines. Length, 275 mm. (Preopercle, 2—3.)

4951. Philippines. March 29, 1908. Length, 189 mm.

5889. Polloc. May 22, 1908. Length, 142 mm. Dark, probably olivaceous. No apparent markings on dorsal. Teeth pale, slightly reddish. Lips little paler. In alcohol, lower parts somewhat washed with red.

10542. Polloc, Mindanao. May 22, 1908. Length, 130 mm.

8748. Porongpong Island. June 10, 1909.

11748, 12056, and 13581. Port Banalacan, Marinduque. February 23, 1909. Length, 139 to 198 mm. (11748, canines, upper, 0—0; lower, 1—1; 12056, preopercle, 2—0.)

22709. Port Caltom. December 15, 1908. Length, 95 mm.

12056 and 18713. Port Dupon, Leyte. March 17, 1909. Length, 139 to 194 mm. (12056, preopercle, 2—0.)

12432. Port Galera. October 27, 1909. Length, 160 mm. (Preopercle, 0—1.)

6365 to 6368. Port Jamelo. July 13, 1908. Length, 198 to 210 mm. (6365, preopercle, 1—2; 6366, preopercle, 2—1.)

11036. Port Maricaban. June 21, 1908. Length, 110 mm.

1458. Port Palapag. June 3, 1909. Length, 102 mm.

5667. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 197 mm.

7057. Port San Pio Quinto, Camiguin Island. March 11, 1908. 2 examples. Length, 162 to 174 mm. (Preopercle, 1—1, 2—2.) Teeth white. Gray. Fins more or less reddish, except narrow dark margin to verticals. Pectoral slightly yellowish at tip.

7055. Port San Pio Quinto. November 11, 1908. Length, 115 mm.

7109 to 7111. Same locality. November 12, 1908. Length, 258 to 278 mm.

12106. Port Uson, west of Pinas Island. December 17, 1908. Length, 180 mm. (Preopercle, 1—0.)

7417 and 7418. Port Uson, Busuanga Island. December 19, 1908. Length, 34 to 245 mm. [935,937.] 7 examples. (7418, preopercle, 1—1; 7417, canines, upper, 2—2; lower, 1—1; preopercle, 1—1.) Dusky orange shades on anterior part of body, merging to lemon yellow on caudal peduncle; top of head dusky, with reddish brown shades; many indistinct pale slaty spots and stripes; preorbital with greenish shades; lower lip bluish; chin band of blue; throat and dash on subopercle blue; dorsal front and margin bright blue; inframarginal bar and at base somewhat orange; body of fin greenish yellow, becoming more clearly yellow posteriorly; caudal bright lemon, edges slightly blue; front margin and little at base of anal bright blue, body of fin pale

orange; ventrals blue, with fronts bright; pectoral hyaline, with orange shade; small dusky blotch at upper base of pectoral, very pale blue bar across base.

7498, 7499, 12062. Pujada Bay, Mindanao. May 15, 1908. Length, 152 to 237 mm. [625, 634 to 636.] General color pale olivaceous gray; head and breast bluish white or flushed with red in smaller specimen; central portion of scales on side with brown reticulating and radiating lines. Dorsal front and edge smoky purplish, centrally and in anterior half olivaceous bar, pink on either side; posterior portion hyaline orange, continuing color of pinkish part in front. Caudal purplish, narrowly edged white. Anal dull geranium, margined white. Ventral same, fronts with smoky shade. Pectoral at base and in axil bright sulphur yellow, becoming hyaline terminally and below, blackish blotch in the upper part of base. Teeth soiled white; obscure slaty band in front of interopercle.

10748, 18967, 18968. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 140 to 173 mm. (10748, preopercle, 2—1; 18967, preopercle, 1—(?); 18968, preopercle, 2—1.)

19467. Ragay River. March 10, 1909. Length, 130 mm. (Preopercle, 1—1.)

6411. Rasa Island, Mantaquin Bay. April 1, 1909. Length, 320 mm.

7392, 9368, 9370, 19921. Romblon Harbor. March 25, 1908. Length, 128 to 172 mm.

5296. Romblon. March 26, 1908. Length, 171 mm. Olive, whitish below; breast and throat washed with rosy; lips pale; dull reddish band behind lower, followed by gray and then reddish; teeth white; dorsal slaty on front and tip, reddish shades below and green centrally; caudal purplish; anal rosy, paler along margin; ventral same; pectoral very pale yellow, including axil, dusky at base outwardly above; iris with golden.

14772 and 14773. Same data. Length, 106 to 198 mm.

13358. Sablayan, Mindoro. December 12, 1908. Length, 151 mm.

A. 450. Sacol Island. September 9, 1909. Length, 227 mm. (Preopercle, 1—2.) Teeth dusky white; general color gray; bases of scales narrowly reddish; top of head with olivaceous wash; snout and chin pink, with dashes and spots of green; green dot on interopercle; front and margin of dorsal and anal blue, dorsal reddish brown with translucent greenish band made up of spot on each membrane through center; green at base of rays; anal similar, but green central spots very obscure; caudal with blue edges to lobes, rays translucent purplish, membranes with greenish at base centrally; ventrals pale orange, blue fronts; pectorals dusky hyaline, brassy below, upper rays bluish, purplish stripe through upper part.

10917, 11896, 18160, 22067. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 114 to 175 mm. (10917, preopercle, 1—1; 11896, preopercle, 0—1, 1—0.)

5686. Santa Cruz, Marinduque. April 24, 1908. Olive and gray; fins uniform, except dusky dorsal margin; caudal and anal with purplish red shades; ventral brighter red. No canines.

4997, 4998. Simonor Island. February 24, 1908. Length, 238 to 248 mm. (Preopercle, 1—1.)

12601. Sitanki Wharf. February 26, 1908. Length, 156 mm.

8341. Subig Bay, Subig. January 7, 1908. Length, 132 to 247 mm.

16035. Sulade Bay. September 18, 1909. Length, 173 mm.

5013. Surigao, Mindanao. May 8, 1908. Length, 155 mm.

12491. Tara Island. December 14, 1908. Length, 172 mm. (Preopercle, 1—1.) [776.] Teeth dusky rose. Tail yellow. Dorsals orange, front and edge blue. Body rosy olive. Mouth banded blue.

1 example, Tara Island. December 15, 1908. Length, 34 mm.

8222. Tataan. February 20, 1908. Length, 161 mm. (Preopercle, 2—1.)
12373. Tataan. February 21, 1908. Length, 120 mm.
14300 and 16269. Teomabal Island. September 18, 1909. Length, 118 to 171 mm. (14300, preopercle, 1—2.)
6780 and 6781. Tictauan, Mindanao. September 8, 1909. Length, 238 to 250 mm.
6414 to 6416. Tilig, Lubang. July 14, 1908. Length, 233 to 265 mm. (6414, canines, upper, 3—2; lower, 0—0; 6416, canines, upper, 2—3; lower, 0—0.)
14472 and 14473. Tomahu Island. December 12, 1909. Length, 188 to 198 mm. (14472, preopercle, 1—1; 14473, preopercle, 1—2.)
6169. Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 97 mm.
12707. Trinidad Island, reef of south lagoon. February 26, 1908. Length, 100 mm.
5019. Tumindao, south lagoon anchorage. February 26, 1908. Length, 127 to 164 mm. 3 examples. (Preopercle scales, 0—0, 1—1, 1—1.)
7925. Tutu Bay, Jolo Island, first anchorage. September 19, 1909. Length, 233 mm. (Canines, upper, 2—1; lower, 0—1; preopercle, 1—0.)
7806 to 7808. Ulugan Bay, near Baheli River mouth. December 28, 1908. 4 examples. Length, 84 to 140 mm. (Unnumbered example, preopercle, 2—1.)
7673. Ulugan Bay, Palawan Island. December 28, 1908. (Preopercle scales, 2—0; no canines.) Uniform gray or olive. No bars on fins.
20878. Usada Island. March 3, 1908. Length, 69 mm.
6647, 9156, 9157. Varadero Bay, Mindoro. July 23, 1908. Length, 183 to 210 mm. (9156, preopercle, 3—2). [6647.] Teeth rosy. Body yellowish or olive yellow, markings bright blue.
6624. Same data. Length, 290 mm.
13526. Uki, Bouro. December 9, 1909. Length, 160 mm. (Preopercle, 4—3.)
11072. Limbe Strait, Celebes. November 12, 1909. Length, 186 mm.
17991. Limbe Strait. November 10, 1909. Length, 183 mm. (Preopercle, 1—1.)
A. 828 and 9698. Talisse Island. November 9, 1909. Length, 169 to 229 mm. (A. 828, preopercle, 2—1; 9698, preopercle, 0—1.)
A. 1309. Tifu Bay. December 10, 1909. Length, 218 mm.
13263. Gane Road, Gillolo Island, Moluccas. December 1, 1909. Length, 191 mm.
12903, 13283, 13285. Great Tobea Island. December 14, 1909. Length, 148 to 200 mm. [2144 to 2146.] (12903, preopercle, 1—1; 13283, preopercle, 1—1.) Olive; white, washed with salmon below; lower head with some slaty shades; teeth dusky; lips similar to adjacent tissues and not set off distinctly; very pale band behind chin; front and margin of dorsal pale slaty; body dark orange, with olive band through center becoming obsolete on soft portion, varying into orange; tail smoky, with narrow white edge in fork; anal reddish orange, becoming pale at margin, but not slaty; ventral similar to anal; pectorals very pale yellow, dusky at base of upper ray; iris dusky and golden.
A. 1314. Great Tobea Island. December 14, 1909. Length, 225 mm.
21328 to 21330. Great Tobea Island. December 15, 1909. Length, 138 to 173 mm. (21328, preopercle, 1—1; 21329, preopercle, 1—1.)
A. 1546. Formosa. January 25, 1910. Length, 350 mm. (Preopercle, 2—1.)
A. 1571. Formosa. January 25, 1910. Length, 312 mm. (Preopercle, 3—2.)
18257. Formosa. December 11, 1909. Length, 160 mm. (Preopercle, 0—0.)
12164. Apra Bay, Guam. September 19–21, 1907. Length, 175 mm.
6813. Kowloon market, China. September 19, 1909. Length, 250 mm. (Preopercle, 2—1.)

19222 U.S.N.M. Fanning Islands. Dr. T. H. Streets. 3 examples. Length, 133 to 205 mm. All stained.

51710 U.S.N.M. Honolulu. *Albatross* collection. Length, 165 mm.

52039 U.S.N.M. Negros Island. Dr. B. Dean. Length, 138 mm. Greatly darkened by formaline. Small dark spot at pectoral origin. Lips largely conceal teeth; no canines and no scales on preopercle flange. As *Callyodon muricatus.*

52279 U.S.N.M. Apia, Samoa. Bureau of Fisheries. Length, 203 mm. Preopercle scales 2—2, each pair separated by an interval. As *Callyodon balinensis.*

52368 U.S.N.M. Samoa. Bureau of Fisheries. 3 examples. Length, 166 to 215 mm. Preopercle, 3—3, 3—4, 2—3. All show 3 pale longitudinal abdominal lines. As *Callyodon erythrodon.*

52380 U.S.N.M. Apia. Bureau of Fisheries. Length, 205 mm.

52396 U.S.N.M. Samoa. Bureau of Fisheries. 15 examples. Length, 47 to 235 mm. As *Callyodon lacerta.*

84259 U.S.N.M. Zamboanga. Length, 190 mm. Canines, upper, 1—1; lower, 0—0; preopercle, 2—3. Pectoral dark. As *Callyodon balinensis.*

CALLYODON HYPSELOPTERUS (Bleeker)

Scarus hypselopterus Bleeker, Nat Tijds. Ned. Indie, vol. 4, 1853, p. 946. Batavia, Java.

Pseudoscarus hypselopterus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1861, p. 36, pl. 8, fig. 3 (Java).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 311 (compiled).

Depth 2⅔ to 2⅘; head 3 to 3⅛, width 2 to 2⅔. Snout 2½ to 2⅗; eye 6, 2¼ to 2¾ in snout, 1⅞ to 2⅛ in interorbital; mouth cleft 5⅔ to 6 in head; upper lip covers ¾ to ⅘ of teeth; canines usually absent, when present moderate and 1 above each side or 1 below each side; interorbital 3 to 3⅛ in head, convex. Gill rakers 22+26, slender, flexible, short.

Scales in lateral line 17+5+2; 2 scales above lateral line, 6 below, 4 or 5 predorsal; cheek with 3 rows of scales of which 0 to 2 on each preopercle flange. Scales with 23 to 26 basal striae, apical 20 to 21; circuli very fine.

D. IX, 10, 1, second spine 2$\frac{1}{10}$ to 2⅕ in head, first ray 2⅕ to 2⅘; A. III, 9, 1, third spine 3 to 3⅕, first ray 2⅗ to 3; caudal 1¼ to 1⅖, little emarginate, little convex as expanded; least depth of caudal peduncle 2⅙ to 2¼; pectoral 1¼ to 1⅓; ventral 1⅓ to 1⅔.

Brown generally, little paler below, with 2 or 3 lowest rows of scales showing as many longitudinal whitish streaks. Fins all dull uniform brown, at front of anal rays medianly usually neutral dusky blotch, ill defined and variably large as eye. Paired fins pale. Pectoral with small neutral dusky spot at origin.

Known only from the East Indies, and Micronesia. It is very close to *Callyodon dubius*, though sufficiently if only slightly distinct. Alcoholic specimens are not always readily distinguished. It may be known, however, by the higher anterior spines and the usual dark blotch at the front of the anal, also usually one or no scales on the

preopercle flange. The dark anal blotch is not shown in Bleeker's figure.

5058 and 5059. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. (5058, preopercle 1—1 [1222]; 5059, preopercle 0—0 [1223]. Length, 151 to 187 mm. Teeth white; general color olive gray, fading to more or less pearly; lips dark gray or slaty, band of slaty or bluish behind chin; top of head more or less spotted with brown in interorbital region; narrow brownish bar from corner of mouth to eye; pale stripes on each of three or four lower rows of scales in abdominal region; front and margin of dorsal blue; body orange with green median bar in anterior portion; caudal, caudal peduncle and fin yellow; anal bluish distally, with purplish shades on base and blue at extreme bases of rays; ventrals bluish, fronts more intense; pectorals dusky, membranes hyaline.

11198. Alimango Bay, Burias Island. March 5, 1909. Length, 165 mm. (1213.) (Preopercle, 1—1.)

16114. Bolalo Bay. December 21, 1908. Length, 129 mm. (Preopercle, 1—1.)

18934. Batan Island. June 5, 1909. Length, 179 mm. (Preopercle, 0—0.)

16808 and 19183. Butauanan Island. June 12, 1909. Length, 142 to 150 mm. (16808, preopercle, 0—0; 19183, preopercle 1—1.)

17182. Butauanan Island. June 13, 1909. Length, 160 mm. (Preopercle, 0—0.)

11270 and 11271. Biri Channel. June 1, 1909. Length, 196 to 210 mm. (11270, canines, upper, 0—2; lower, 1—1; preopercle, 1—1; 11271, preopercle, 1—0.)

7461. Bolalo Bay, Palawan Island. December 21, 1908. (Canines, upper, 1—1; lower, 1—1; preopercle, 0—0.) Length, 216 mm. Teeth dusky; general color purplish gray; anterior portion of back heavily shaded with black; lower head with pale blue stripes. Dorsal front and margin dull indigo, body pale orange, with greenish central bar merging into yellowish of posterior portion. Caudal rather yellowish. Anal blue terminally, more or less purlish shades basally. Ventral blue. Pectorals hyaline, with slight purplish shades and black blotch at upper base.

7812. Bugsuk Island. January 5, 1909. Length, 280 mm. Teeth rosy; head and body rosy; caudal peduncle and fin yellow; dorsal yellowish rose with somewhat lavender front and border very pale and brighter posteriorly obscure central bar; anal similar , more yellow, lavender margin brighter; paired fins rosy, fronts and upper rays most colored.

7248. Busbus Point, Siasi Island. September 20, 1909. Length, 173 mm. (Preopercle, 1—1.)

15032. Busin Harbor. March 7, 1909. Length, 105 mm. (Preopercle, 0—0.)

7196 and 7197. Busin Harbor, Burias Island. March 8, 1909. Length, 166 to 191 mm. (7196, preopercle, 1—1; 7197, canines, upper, 0—2; lower, 0—1; preopercle, 0—0.)

11138. Cabugan Island, Hinunangan Bay, Leyte. June 30, 1909. Length, 151 mm.

8023. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 227 mm. (Canines, upper, 2—2; lower, 1—1; preopercle, 1—1.) Gray; pale belly with traces of white streaks; teeth dusky white; lower lip slaty, with slaty bar behind chin; throat pale greenish. Front and margin of dorsal very pale slate gray, body of fin yellowish or orange, more or less dusky, clearer posteriorly, no bar. Caudal region including peduncle and all of fin dusky yellowish. Anal pale orange, front and margin whitish. Ventral pale orange, fronts somewhat slaty gray. Pectoral very pale orange, with dusky blotch at upper base.

8034. Capulaan Bay, Pagbilao Island. February 24, 1909. 2 examples. Length, 180 to 185 mm. (Preopercle, 1—1 and 2—1.) Head and body gray, becoming pale below and yellowish posteriorly; teeth white; lips bluish, most pronounced below; blue band behind chin, brown color continues across corner of mouth and preorbital to eye; blue borders of lower fins brighter in smaller example; orange brown body of dorsal divided centrally by somewhat obscure greenish band.

12093. Capunuypugan Point, Mindanao. May 10, 1908. Length, 145 mm.

5324. Cebu market. April 4, 1908. Length, 230 mm. (Canines, upper, 1—2; lower, 0—0; preopercle, 1—1.) Teeth reddish; upper lip pale, similar to top of head, latter vermiculated with obscure reddish lines; lower lip narrowly blue, pale behind; blue band on chin running back mesially; general body and head color gray with some rosy; anal and dorsal narrowly on front and tip blue, somewhat orange centrally with an obscure band in front on dorsal; caudal yellowish; ventral pale blue, front darkest; pectoral straw color. Iris golden.

16338. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 126 mm. (Preopercle, 1—1.)

10832 and 10833. Dalaganem Island. April 8, 1909. Length, 178 to 191 mm. (10832, preopercle, 1—1; 10833, preopercle, 0—0.)

6812. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 155 mm. (Preopercle, 0—0.)

13402. Langao Point, Luzon. June 24, 1909. Length, 188 mm. (Preopercle, 0—0.)

5405. Mactan Cove, Mactan Island. April 6, 1908. Length, 228 mm. (Canines, upper, 0—1; lower, 0—0; preopercle, 1—1.)

14574. Maculabo Island. June 14, 1909. Length, 154 mm.

12019 and 12158. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 184 to 206 mm. (12019, preopercle, 1—1; 12158, canines, upper, 1—0; lower, 0—0; preopercle, 0—0. [935].)

15893. Mansalay, Mindoro. June 4, 1908. Length, 190 mm. (Preopercle, 0—1.)

9056. Masbate Reef. April 20, 1908. Length, 146 mm. (Preopercle, 1—0.)

5568. Masbate Reef, Masbate. April 20, 1908. Length, 203 mm. (Preopercle 0—0.) Reddish on interorbital, slaty band behind and in chevrons.

18613. Mompog Island near Marinduque. March 3, 1909. Length, 188 mm. (Preopercle, 0—1. [1199].) Olive green above, becoming pearly with more or less salmon wash below; caudal, caudal peduncle, and fin bright yellow; teeth dusky white or rosy, slightly blue on lower lip and in band behind chin; chin brownish, color continuing as thin line across preorbital to eye; interorbital area more or less spotted with red or brown. Dorsal front and margin slaty, fading out posteriorly; body orange, becoming yellow posteriorly, with obscure greenish central bar most apparent through spinous portion. Front of anal blue, terminal third of fin pale bluish in front; basal portion pale, orange. Ventrals very pale orange, fronts bluish. Pectorals very pale dusky orange; dark blotch on upper portion of base.

17287. Nabatas Point, Samar Island. July 24, 1909. Length, 158 mm. (Preopercle, 0—0.)

12645. Port Palapag, near northern Samar. June 3, 1909. Length, 166 mm. (Preopercle, 0—1 [1586].) Caudal wholly pale yellow; dorsal and anal with blue borders; body of dorsal yellowish with faint trace of central band; teeth white; blue lower lip and chin band; brownish mottlings on top of head and about eye.

7056. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 187 mm. (Preopercle, 1—1.)

7499. Pujada Bay, Mindanao. May 15, 1908. Length, 153 mm. [625.]

8965. Rapurapu Island and Strait. June 22, 1909. Length, 180 mm. [1816.]

5685. Santa Cruz. April 24, 1908. Length, 250 mm. (Canines, upper, 1—0; lower, 1—1; preopercle, 1—1.) Middle of upper side gray with purplish shades; borders of scales reddish; front, back and top of head dusky green; interorbital spotted and vermiculated with pink lines; teeth white; lower lip bluish green; chin purplish, with narrow pink line across preorbital; lower interorbital region purplish; throat line blue, continued across all of ventral edge; dash of green on front of interorbital; cheek grayish green; broad green stripe from eye downward through base of pectoral; posterior body and caudal peduncle dusky green (viridian shade); breast and lower parts with purplish cast. Dorsal front and margin antwerp blue, except last one and half rays; purplish geranium line below of equal width; broader bar of green, becoming yellowish posteriorly; basal portion royal purple on middle of fin, shading into geranium at each end; last ray greenish. Caudal edged with antwerp blue; dull purplish stripe below; body of fin purplish at base, dusky at tip, with bluish tints throughout. Anal front and distal $\frac{2}{5}$ antwerp blue, basal portion purplish except last ray which blue; bluish median stripe below caudal peduncle. Ventral bright blue, with pale purplish stripe on second ray. Pectoral dusky straw color, base bright green, also axil and latter with black blotch at upper edge. Iris brassy and pink.

5013. Surigao, Mindanao. May 8, 1908. Length, 156 mm.

12335 and 12336. Tara Island. December 15, 1908. Length, 173 to 177 mm. (Preopercle in both, 1—1 [795, 796].) Bluish drab; top of head with brownish mottling; caudal peduncle and caudal fin lemon yellow; dorsal blue in front and margin; body with orange shades; hyaline greenish indistinct central bar; anal blue, margin with lilac base; ventrals blue; pectorals dusky, with slight orange shade; blue throat line and chin band.

18915. Tictauan Island. September 8, 1908. Length, 176 mm. (Canines, upper, 1—1; lower, 0—0; preopercle, 0—0.)

18257. Teomabal Island. December 11, 1909. Length, 158 mm.

7690 and 7691. Ulugan Bay, Palawan Island. December 29, 1908. Length 199 to 230 mm. (7960, canines, upper, 3—2; lower, 0—0; preopercle, 1—0; 7691, preopercle, 0—0.) [992.] Teeth dusky; blue bands on chin; front margin and base of dorsal blue, orange body with few obscure green spots through center. Anal front and margin blue, base slightly blue. Ventrals bluish. Pectorals yellow.

14511. Ulugan Bay, Rita Island. December 29, 1908. Length, 180 mm. (Preopercle, 1—0.)

CALLYODON NUCHIPUNCTATUS (Valenciennes)

Scarus nuchipunctatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 224. Sea of the Indies.

Pseudoscarus nuchipunctatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 31, pl. 10, fig. 2 (Java, Sumatra, Celebes, Timor, Amboina, Banda).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 233 (Pelew Islands, Fiji, Samoa, Society Islands, Gilbert Islands, Yap, Ponape).—Guichenot, Mem. Soc. Sci. Nat. Chérbourg, vol. 11, 1865, p. 35 (type).—Günther, Fishes of Zanzibar, 1865, p. 107 (Zanzibar).—Martens, Preuss. Exp. Ost Asien, 1876, p. 397 (Batavia).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 323, pl. 157 (Pelew Islands, Fiji, Samoa, Society Islands, Gilbert Islands, Yap, Ponape).—Weber, Siboga Exp.

vol. 57, Fische, 1913, p. 387 (Banda).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, 1922, p. 53 (Zamboanga).

Scarus niger (not Forskål) Rüppell, Neue Wirbelth. Fische, 1835, p. 24, pl. 8, fig. 1.

Scarus limbatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 271. Macao, China, Java.

Pseudoscarus limbatus Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 36 (type).

Scarus prasiognathos Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 272. New Ireland.

Pseudoscarus prasiognathus Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 56 (type).

Callyodon prasiognathus Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 509 (Okinawa).

Scarus erythrogenys (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 32 (name in synonymy).

Callyodon maoricus Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 328, pl. 48, fig. 3. Pago Pago, Samoa.—Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 509 (Nafa, Okinawa).

Depth 2/5 to 2 2/3; head 2 3/4 to 3, width 2 1/8 to 2 1/4. Snout 2 1/4 to 2 4/5; eye 4 4/5 to 7 1/3, 1 4/5 to 3 1/8 in snout, 1 3/4 to 2 2/3 in interorbital; mouth cleft 3 2/3 to 4 2/5 in head; lips largely cover teeth; canines absent, 1 to 3 above each side posteriorly, usually none below; interorbital 2 1/2 to 3 1/6 in head, convex. Gill rakers 13 + 22, short, slender, flexible.

Scales in lateral line 17 to 20, 4 to 6 + 2; 2 scales above lateral line, 6 below, 8 predorsal; 3 rows of scales on cheek, of which lowest row of 2 to 4 scales on preopercle flange, rarely 1 scale. Scales with 27 to 33 basal radiating striae, apical 28 to 31; circuli very fine.

D. IX, 10, 1, ninth spine 2 5/6 to 3 2/5 in head, first ray 2 1/2 to 3 1/4; A. III, 9, 1, third spine 2 7/8 to 3 1/8, first ray 2 1/5 to 3 1/5; caudal 1 1/5 to 1 1/2, emarginate, in young convex behind, with age double concave and ends exserted; least depth of caudal peduncle 2 to 2 1/3; pectoral 1 1/3 to 1 1/2; ventral 1 3/4 to 1 7/8.

Deep vandyke brown to clove brown, more or less uniform. Scales often with dark blotch basally. Pale brown submarginal lines on upper lip and one on lower, also another lower and parallel across chin; pale brown line variably from rictus to eye and another postocular which may be variously broken, to suprascapula, or sometimes only as pale bar on scale below suprascapula. Fins dark. Dorsals and anals with brown edges. Caudal with pale brown edges above, below, and broadly behind. Paired fins dark.

Zanzibar, East Indies, Riu Kiu, Micronesia, Society Islands. Differs from most all the East Indian species in the narrow pale or buff edges to the ventrals. Often examples are uniformly dusky black, only the suprascapular scale appearing slightly dull brown.

11101. Agojo Bay. December 14, 1908. Length, 148 mm.

5187, 7221, 15170. Alibijaban Bay, Ragay Gulf, Luzon. Length, 185 to 247 mm. [1235, 1236.]

8158 to 8160. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. (8158, canines, upper, 2—1; lower, 0—0; 8159, canines, upper, 2—1; lower, 0—0; 8160, canines, upper, 1—2; lower, 0—0.) Teeth indigo; lips blackish scarlet; general color, very dark green, bluish rather than clove; borders of dorsal and anal dark china blue on narrow black line; interopercular region, breast, belly, and paired fins very dark purplish; body of dorsal and broad stripe at caudal lobes orange purplish; middle portion of caudal about body color at base, blue at tip, and yellowish green just in front of tip.

8105 and 16069. Alimango Bay, Burias Island. March 5, 1909. Length, 205 to 250 mm. (8105, canines, upper, 3—2; lower, 0—0; 16069, canines, upper, 2—1; lower, 0—0.)

6498 and 6499. Balikias Bay. July 17, 1908. Length, 230 to 273 mm. (6498, canines, upper, 1—1; lower, 0—0.) Very dark green, fading to claret brown, scales narrowly bordered with brown. Teeth green. Upper lip broadly red, lower narrowly; dark green band across nose and chin, second behind on chin and continued on throat as bluish. Bluish stripe near lower edge of interopercle; another above on lower preopercle edge crossing into edge of interopercle; green stripe from mouth corner till under eye; short stripes radiating about eye. Front and edge of dorsal and anal narrowly blue, also caudal edges; general color of dorsal, purplish with terminal orange shades; anal similar, but with more green; caudal tipped blue, body green, lobes with purplish shades; ventral purplish, front blue; pectoral soiled purple.

7962. Baluk Baluk Island. September 12, 1909. Length, 295 mm. (Canines, upper, 2—1; lower, 0—0.) General color, very dark smoky gray. Vertical fins and ventrals edged blue. Teeth blue. Lips dusky rosy.

12123. Biri Channel. June 2, 1909. Length, 178 mm.

8077. Burias Island. March 5, 1909. Length, 275 mm. (Canines, upper, 2—2; lower, 0—0.)

5614 and 5615. Busin Bay, Burias Island. April 22, 1908. Length, 293 to 300 mm. Viridian green; teeth same color, more blue; edges of scales narrowly claret; slaty overshade on body from dorsal downward behind pectoral; on shoulder bright yellowish green ocellus, with purple rim; head dark olivaceous with reddish shades about eye and across snout; upper lip broadly orange, with brilliant green band behind; lower lip narrowly orange, with bluish behind; purplish band across chin; cheek somewhat uniform green; suborbital and interopercle mottled with green and purple, purple running around edges of opercle; throat line green; edges of opercle and branchiostegal membrane purple; breast purple. Dorsal narrowly on front and margin blue, body claret, with green mottlings in center; caudal edged and tipped with blue, with broad heliotrope purple stripe on each lobe; center of fin dusky green; anal front and tip blue, central portion bronzy, without luster, membranes striped with dark green; paired fins purple; front and tip of ventral blue; iris reddish and golden.

5650, 6839, 6840. Busin Bay, Burias Island. April 23, 1908. Length, 230 to 377 mm. (6839, canines, upper, 1—2; lower, 0—0.) Purple black, greenish shades still evident in some lights, paling to claret brown below, edges of scales darker; teeth antwerp blue; upper lip broadly red, broader than purple; dark green band behind followed by reddish; lower lip narrowly red, with greenish and slaty band behind, slaty centrally, projecting somewhat backward; blue longitudinal line on throat; area behind first chin band backward to opercle claret brown; bar of green and slate across front of interopercle, and more or less vermiculated mottling of dark green behind; broken green band on preorbital passing backward under eye; another above eye; short dash behind middle of eye; line above eye continued backward as interrupted spots, last

larger one on shoulder. Dorsal front and margin, except last three rays, china blue on black; body of fin claret and brown, with greenish shades posteriorly; base green under scales of sheath. Edges of caudal lobes china blue on black; tip similar but paler; broad dark claret stripe on each lobe, central rays sooty green; anal like dorsal. Paired fins body color, front of ventral blue. Pectoral nearly uniform.

5658. Busin Harbor, Burias Island. April 23, 1908. Length, 278 mm.

6270. Candaraman Island, Balabac. January 4, 1909. Length, 124 mm. [1024.] Green shoulder mark.

6692. Catbalogan, Samar. April 15, 1908. Length, 198 mm. Dark purple or black, with green shoulder marks. Teeth greenish. Upper lip red, lower blue, with very narrow red border; blue chin band, with stripe through eye. Dorsal, anal, and caudal edges and ventral front, blue.

21175. Catbalogan, Samar. April 15, 1908. Length, 132 mm.

5625. Caxisigan Island, off Balabac. January 2, 1909. Length, 172 mm.

5315 and 5323. Cebu market. April 4, 1908. Length, 223 to 273 mm. General color, green black; teeth china blue; lips scarlet, upper one broadly, dark green line behind both above and below; claret behind on chin; pale on front of head above; dark green stripe from front of eye half way to corner of mouth, then downward on chin and back in median line to isthmus; small blotches of green behind orbit, double line on interorbital; bright green blotch size of pupil on shoulder; body scales edged with dark claret; front and edges of dorsal and anal, edge of lobes and tip of caudal, bright china blue; dorsal with some blue at base, body of fin very dark umber; anal same, with greenish shades; lobes of caudal umber, central portion almost body color; ventral blue, front and edge very dark purplish as main body. Pectoral very dark smoky purple; iris golden.

6216 to 6220. Galera Bay. June 9, 1908. Length, 170 to 270 mm. Green, with orange lips. Scales very dark green, with claret or bay edges. Breast purple. Shoulder green. Teeth green.

16640. Same data. Length, 142 mm.

6359 and 6360. Jamelo Bay. July 13, 1908. Length, 220 to 282 mm. [6359.] General color, brownish. Teeth green. [6360.] General color, dark green. Teeth green. Lips orange. Green bands and spots on chin and throat.

13090. Kapoposang Island. December 28, 1909. Length, 160 mm.

6064. Little Santa Cruz Island, Zamboanga. May 28, 1908. February 25, 1909. Length, 287 mm. Very dark green, with claret margin to scales which shows after fading. Upper lip broadly scarlet, lower lip narrowly and very dark green behind each; viridian lines radiate from eye, one across preorbital downward in front interorbital, running backward as mesial throat line with bluish shade; greenish lines or spots bordering interorbital and around lower and hinder edge of cheek; light green spot on shoulder. Dorsal with front edge indigo, body with reddish shades. Caudal lobes edged indigo; broad reddish stripe within terminally one-half of central portion, pale greenish margined with blue; basally with purplish shades. Front edge and last half ray of anal bright blue, body pale blue with reddish shades, probably near body color in life. Ventral smoky purplish, with blue front.

6065 to 6068, 6071. Little Santa Cruz, Zamboanga. May 28, 1909. Length, 134 to 223 mm. Bright green anteriorly, dusky yellow posteriorly. Interorbital green, anteriorly bluish with lilac tints. Lips lilac pink; bright green band behind upper lip, fusing into green cheek margin, branch of which extends to mouth corner and another across chin; lower lip same as upper; blue line on throat. Cheek behind throat and opercle dull greenish, shading into dusky and yellowish; suborbital region with bluish lilac shades extending

back toward edge of opercle; short radiating lines behind and above eye. Lower head and breast pale bluish. Abdominal region bluish pink, with median and two other lines of blue or green. Pink and blue lines extend backward above anal base. Dorsal front and edge, base and last ray green, body reddish, somewhat orange terminally; median region of greenish. Caudal bright blue with yellowish green spots near tip, somewhat reddish shades basally. Front and terminal half of anal bright green, basal portion lilac, and last ray bluish. Ventrals pale green, fronts blue. Pectorals green, one membrane of upper portion pink, fin tip dusky. Teeth blue. Iris silvery. Some examples very dark reddish brown when fresh.

11235. Mactan Island, Cebu. March 25, 1909. Length, 170 mm.

8732. Manila market. December 12–18, 1907. Length, 214 mm. (Canines, upper, 2—2; lower, 0—0.)

12353 and 15894. Mansalay, Mindoro. June 4, 1908. Length, 165 to 171 mm.

6139 and 6140. Same data. Length, 242 to 248 mm.

6528 to 6530. Maricaban Island Reef. July 21, 1908. Length, 220 to 262 mm. (6528, canines, upper, 1—2; lower, 0—0; 6530, canines, upper, 1—1; lower, 0—0.) Dark green shoulder blotch. Body with round dark spots in scales at times.

4581, 4584, 4585, 18615. Mompog Island, near Marinduque. March 3, 1909. Length, 145 to 233. (18615, canines, upper, 1—2; lower, 0—0 [1202].) Upper lip scarlet; chin and lower head more or less scarlet, bands bright green; scales of sides when faded show small blotches distinctly.

6619. Northwest point Verde Island. July 22, 1908. Length, 245 mm. (Canines, upper, 2—2; lower, 0—0.)

9609. Pagapas Bay. February 20, 1909. Length, 153 mm.

6186. Palapag Bay vicinity, Luzon. June 16, 1909. Length, 154 mm.

7285. Paluan Bay, Mindoro. December 11, 1908. Length, 233 mm. (Canines, upper, 1—2; lower, 0—0.)

10491. Port Maricaban. July 21, 1908. Length, 171 mm.

4602 and 4604. Port Palapag, near northern Samar. June 3, 1909. Length, 165 to 180 mm. [1584.] Borders of anal, dorsal, and caudal bright paris blue; body of anal and dorsal reddish, without bars; caudal lobes with broad reddish stripe through each bounded by blue inwardly; middle of fin dusky; green head markings as usual.

5804 and 5805. Pujada Bay. May 15, 1908. Length, 198 to 220 mm. Teeth green. Shoulder blotch green, small. Lips scarlet, with green bands.

8785 and 21415. Quinalasag Island, Masamat Bay. June 12, 1909. Length, 320 mm. (8785, canines, upper 2—2; lower, 0—0.)

8967. Rapurapu Island and Strait. June 22, 1909. Length, 232 mm. (Canines, upper, 1—1; lower, 0—0.)

15640. Sablayan, Mindoro. December 13, 1908. Length, 142 mm.

5220. Siasi Island market. February 17, 1908. Length, 180 mm.

11500. Sulade Island. September 17, 1909. Length, 78 mm.

5711. Surigao, Mindanao. May 8, 1908. Length, 250 mm.

12337. Tara Island. December 15, 1908. Length, 193 mm. (Canines, upper, 3—3; lower, 0—0 [797].) Shoulder mark green.

12490 and 12495. Tara Island. December 14, 1908. Length, 155 to 195 mm. [774, 777.] Shoulder mark green. Teeth green. Lips scarlet.

4934. Tataan, Tawi Tawi Group. February 20, 1908. Length, 223 mm. General color, purplish slate, edged with darker; scales of middle region of back and body with from one to three small round nearly black spots. Lower parts flushed with crimson. Teeth pale green, upper and lower lips scarlet; immediately behind narrow band of dark hooker green on each; again scarlet

shading into purple on top of head above; below bounded by second green band, this in turn by scarlet; wavy green stripe along lower margin of cheek, another parallel on subopercle, and median stripe at junction of branchiostegal membrane; short stripe from eye toward angle of mouth, and another broken one through top of eye backward. Bright green spot on shoulder and few irregular green markings on orbit. Dorsal purplish red, becoming brighter just under submarginal black line; front and edge of fin with blue band. Caudal purplish, edged with blue. Anal bright dahlia, with purple front and margined by broad band of blue bordered by submarginal line of black. Ventral crimson, spine and tip of first ray with slaty blue. Pectoral dusky purplish. Iris with golden green shades.

4942. Same data. Length, 247 mm. General color, dark hooker green, lacking round spots on scales; teeth little exposed; scarlet of upper lip broad. Scales narrowly edged with dark heliotrope purple; top of head with purplish shades, which surround eye and continue on chin and lower head. Narrow green band across nose; another from corner of mouth across chin, leaving lower lip very narrowly scarlet; from front of eye wavy green line passes downward joining its fellow, runs back as median line on branchiostegal region. Dorsal reddish, with broad blue band on front and upper margin, defined by black; red beneath bright; hinder membranes with green blotches in centers. Caudal yellowish green in center, tipped with blue bar in fork, and becoming emerald green toward base; lobes with broad median stripe of orange red, bordered above and below by blue. Anal with purplish shades, membranes with dusky green centers, front and margin of fin broadly blue, resting on black. Ventral dusky purplish, front edge and middle of tip blue. Pectoral dusky heliotrope purple, tipped with hyaline on membranes. Teeth greenish blue.

6648. Varadero Bay. July 23, 1908. Length, 188 mm. Greenish or indigo teeth. Body dark green, fading to claret ground color. Green shoulder blotch.

7162 to 7164. West coast of Palaui Island. November 18, 1908. Length, 172 to 245 mm. (7162 canines, upper, 2—2; lower, 0—0.) Purplish black, with green shoulder spot. Scales on fading show vertical series of reddish blotches on each, over side of body and back. Teeth, green. Margins of dorsal and anal, blue.

13637. Una Una Road, Binang, Unang Island, Gulf of Tomini, Celebes. November 18, 1909. Length, 169 mm.

12937. Tidore Island, south of Ternate. November 25, 1909. Length, 147 mm.

12169. Apra Bay, Guam. November 19–21, 1907. Length, 123 mm.

6687. Hong Kong market. August 13, 1908. Length, 300 mm. Teeth, indigo green. General color, green, brownish shades over back and sides and top of head. Lips narrowly brown. Brownish line from eye to corner of mouth, on either side green; chin blue. Purplish blotch on one side behind eye. Dorsal with front edge blue, body orange brown, probably bluish or greenish at bases of rays; anal similar. Caudal with edges and tips of lobes blue, body color brown. Ventrals with front and tips blue; body color brown. Pectorals brown, margin of fin dusky, base and upper ray darker.

A. 872. Limbe Strait, Celebes, Dutch East Indies. November 10, 1909. Length, 277 mm. (Canines, upper, 2—2; lower, 0—0.) Plain dark green. Teeth, indigo. Snout with orange brown. Dorsal brown, green stripe in membrane, fin edge blue on black. Caudal with purple brown stripe in lobes, edged all around with blue.

30535 U.S.N.M. New Guinea. Australian Museum. 1 example. Length, 240 mm.

30564 U.S.N.M. New Guinea. Australian Museum. 1 example. Length, 200 mm.

51747 U.S.N.M. Pago Pago, Samoa. Bureau of Fisheries. Type of *Callyodon maoricus*.

58029 U.S.N.M. Zamboanga. Dr. E. F. Mearns. 2 examples. Length, 280 to 305 mm. As *Callyodon nigra*.

75491 U.S.N.M. Nafa, Okinawa. *Albatross* collection. 1 example. Length, 320 mm. As *Callyodon prasiognathus*.

84227 U.S.N.M. Zamboanga. Dr. F. Baker. 1 example. Length, 273 mm.

CALLYODON GUTTATUS (Schneider)

Scarus guttatus Schneider, Syst. Ichth. Bloch, 1801, p. 294. Indian Seas. (On Sonnerat, Journ. Physique, vol. 3, 1774, p. 222, pl. 2.)

Scarus maculosus Lacépède, Hist. Nat. Poiss., vol. 4, 1802, pp. 5, 21, pl. 1, fig. 3. The Great Equinoctial Ocean (Indo-Pacific).—Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 235 (type; Mauritius).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1866, p. 40 (type; Seychelles).

Pseudoscarus maculosus Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 223 (Mozambique); Fishes of Zanzibar, 1865, p. 105 (Aden, Zanzibar, Ibo).

Scarus singaporensis Bleeker, Nat. Tijds. Ned. Indie, vol. 3, 1852, p. 69. Singapore.

Pseudoscarus singapurensis Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 31, pl. 13, fig. 1 (Java and Singapore).

Pseudoscarus singaporensis Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 235 (one of Bleeker's examples).

Callyodon prasiognathus (not Valenciennes) Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 328 (Samoa).

Pseudoscarus brevifilis Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 327, pl. 161. Tahiti and Apamana, Gilbert Islands.

Depth 2½ to 2⅗; head 2⅕ to 3, width 2 1/10 to 2¼. Snout 2⅕ to 2¼; eye 6¼ to 6⅘, 2⅗ to 3 in snout, 2¼ to 2⅘ in interorbital; mouth cleft 4⅕ to 4⅓ in head; lips cover ⅔ of teeth; no canines; interorbital 2⅗ to 2⅞ in head, convex. Gill rakers 18+30, fine, short, slender.

Scales in lateral line 17 or 18+5 or 6+2; 2 scales above lateral line, 6 or 7 below, 6 or 7 predorsal; 3 rows of cheek scales, of which lowest row on preopercle flange with 1 to 3 scales. Scales with 28 to 32 basal radiating striae, apical 25 to 31; circuli fine.

D. IX, 10, I, ninth spine 2½ in head, first ray 2⅖ to 2½, sometimes, but not always, exerted a little with age; A. III, 9, I, third spine 2⅘ to 3⅖, first ray 2½ to 2⅔; caudal 1¼ to 1⅗, slightly emarginate behind, convex as expanded in young; least depth of caudal peduncle 2 1/10 to 2⅛; pectoral 1⅓ to 1⅖; ventral 1⅘ to 1⅞.

Largely uniform deep chocolate to burnt umber, fins similar. On trunk posteriorly in young, and on tail during all ages most scales each with round gray or whitish spot, none larger than pupil. Often these spots form as three or four vertical rows, frequently irregular and in size spots variably large or small. Some examples also show

fins more or less dusky, especially in young. Iris, dull brown. Teeth, greenish. Some large examples without pale spots, uniform deep chocolate entirely, likely obliterated in most cases with preservation of specimen. Same also show greenish line from below eye to chin.

Mauritius and East Africa to the East Indies and in Oceania to Tahiti. The oldest name for this species appears to be the *Scarus guttatus* Schneider. Day places it with *Scarus ghobban* Forskål, but that species has at least four scales in the lowest row on the cheek or the row on the preopercular flange, besides a different color pattern. In this Day followed Klunzinger's suggestion that *Scarus guttatus* and *Scarus maculosus* have only one scale on the preopercle flange, otherwise inseparable from *Scarus ghobban*. We have specimens of *Callyodon guttatus* with the scales 1 to 3 on either preopercle flange. *Scarus ghobban* has been reported from the Philippines as *Pseudoscarus pyrrhostethus* by Elera,[27] though we have been unable to place any of our materials with that species. There is no question but that both *Scarus singaporensis* and *Pseudoscarus brevifilis* are represented so that we are obliged to place them as synonyms.

9626. Agojo Point, Catanduanes Island. June 10, 1909. [1637.] Length 205 mm. Teeth green; narrow green band across chin; front and anterior margin of dorsal and anal slaty, becoming greenish posteriorly; few green spots along base of each posteriorly.

8915. Atulayan Island, Lagonoy Gulf. June 18, 1909. Length, 293 mm.

8692. Batag Island. June 3, 1909. Length, 275 mm.

8943. Between Paron and Jesus Point, Albay Gulf, Luzon. June 21, 1909. Length, 250 mm.

8549. Bisucay Island. April 9, 1909. March 17, 1908. Length, 278 mm.

7813. Bugsuk Island. January 5, 1909. Length, 248 mm. (Preopercle, 2—3.) Teeth green; body bronze gray; head and lower parts with distinct reddish shades in spirits; narrow green band from just below eye across behind chin; few scattered greenish spots on lower side of head, others behind and above eye. Dorsal pale reddish, spines and rays greenish, most marked anteriorly; margin of fin slaty on fleshy spinous tips and bluish on soft tips; few scattered bluish spots in soft portion of fin; anal reddish, with front and margin pale slaty, no spots; caudal reddish with small round green spots about third of diameter of pupil; paired fins reddish; fronts of ventrals slightly slaty.

A. 678. Bumbum Island. September 25, 1909. Length, 343 mm.

15316 and 15317. Cebu market. March 19, 1909. Length, 165 to 193 mm.

8423. Cebu. March 22, 1909. Length, 362 mm. (Canines, upper, 1—0; lower, 0—0.)

2 examples, Cuyo Island. April 9, 1909. Length, 152 to 205 mm.

6363. Jamelo Bay. July 13, 1908. Length, 215 mm. Teeth green. General color brown. Few scattered green spots on side of head. Few scattered pale spots on side of body.

8761 and 8762. Lahuy. June 11, 1909. Length, 310 to 338 mm.

6138. Mansalay. June 4, 1908. Teeth indigo, with white edge; inside of mouth behind teeth, orange; snout, lower lip, top and side of head ocher; side and back purplish green, dark; ocher of head shading into anterior region;

[27] Cat. Fauna. Filip., vol. 1, 1895, p. 559. Luzon, Cavite, Santa Cruz.

throat and breast ochraceous, shading with purplish on belly; some of scales of three lower rows and at base of caudal with bright green spots. Cheek and opercles below green; crescent of the same color across nose, points in eyes. Dorsal front and edge prussian blue, somewhat paler on soft rays; membranes of spinous portion orange; spines dusky greenish blue; orange almost crossing under blue margin; soft membranes yellowish purple near base, spines dusky bluish green at base; both rays and membranes under blue margin bright green; last ray green. Caudal lobes blue at edges; broad orange stripe below, central portion bright green, slightly yellowish at tips. Front and margin of anal bright blue; bar from base of second spine to tip of penultimate ray orange about width of eye; below bright green. Ventral front pale blue, with orange behind, remainder of fin pale green; rays somewhat orange. Pectoral smoky purple, first ray dull indigo; last ray and tips of others green, becoming dusky hyaline. Irish golden, encircled with blue. Orbit ochraceous.

11305. Palag Bay vicinity, Luzon. June 16, 1909. Length, 129 mm.

14360. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 143 mm.

8747 and 8757. Porongpong Island. June 10, 1909. Length, 212 to 268 mm. (8757, preopercle 2—1.)

8968. Rapurapu Island and Strait. June 22, 1909. Length, 280 mm.

19099. Silino Island. August 10, 1909. [1809.] Length, 193 mm. Teeth green; green stripe behind chin upward across preorbital to eye; few dashes of green radiating about eye and some spots on cheek; body olive brown, few whitish spots on sides, particularly posteriorly; margins of dorsal and anal slaty, bluish along base of dorsal; caudal body color, with numerous small round blue spots about half diameter of pupil.

5712. Surigao, Mindanao. May 8, 1908. Length, 238 mm.

12489. Tara Island. December 14, 1908. Length, 205 mm.

6410, 6418, 6419. Tilig, Lubang. July 14, 1908. Length, 240 to 405 mm.

7169. West coast of Palaui Island. November 18, 1908. Length, 224 mm. Very dark, perhaps obvaceous. Teeth indigo. Narrow blue band on cheek. No stripes on throat. Fins not marked, similar to body, but darker.

A. 870. Limbe Strait, Gulf of Tomini, Celebes. November 10, 1909. Length, 320 mm.

A. 1047, A. 1048, and A. 1049. Tidore Island, south of Ternate. November 24, 1909. Length, 303 to 338 mm. Jaws indigo; general color purplish slaty; 748 shows no whitish spot; few present in 749, somewhat obscure ones in 747; fins without bars; general color of body becoming darker distally; iris orange.

52389 U.S.N.M. Samoa. Bureau of Fisheries. 2 examples. Length, 220 to 240 mm. As *Callyodon prasiognathus*.

CALLYODON MURICATUS (Valenciennes)

Scarus muricatus Valenciennes, Hist. Nat. Poiss., vol. 14, 1839, p. 208, pl. 402. Java.

Pseudoscarus muricatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 26, pl. 7, fig. 3 (Java and Moluccas).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 38 (North Celebes).—Elera, Cat. Fauna Filip., vol. 1, 1895, p. 560 (C. de Mindoro).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 316 (Ponape, Pelew Islands, Solomons).

Callyodon muricatus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, 1905, p. 789 (Negros).

Scarus gibbosus (Kuhl and Van Hasselt) Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 27 (name in synonymy).

Depth 2⅖ to 2½; head 2⅜ to 2¾, width 2¼ to 2⅓. Snout 1⅝ to 1⅞; eye 6⅞ to 8⅓, 3⅓ to 4¾ in snout, 2 to 2⅘ in interorbital; mouth cleft 3¾ to 4⅙ in head; lips half cover teeth, completely cover teeth in young, coriaceous; no canines; interorbital 3 1/10 to 3⅙ in head, convexly elevated, upper profile with slight prominence, above and close before nostrils. Gill rakers 9+10, firm, short, on lower branch broadly and transversely triangular.

Scales in lateral line 17+6 to 8+2; 2 scales above lateral line, 5 to 7 below, 6 predorsal; cheek with 2 rows of scales, but suborbital rim naked and 1 or 2 scales on preopercle flange. Scales with 29 to 33 basal radiating striae, edge trilobate; 17 to 20 apical radiating striae; circuli very fine.

D. IX, 10, 1, first spine 2⅛ to 3⅛ in head, first ray 2 1/10 to 2⅔; A. III, 9, 1, third spine 2⅘ to 3, first ray 2⅛ to 2⅘; caudal 1¼ to 1½, slightly double concave, medianly largely convex as expanded; least depth of caudal peduncle 2⅕ to 2⅖; pectoral 1⅔ to 1½; ventral 1⅗ to 1⅞.

Vandyke brown generally, vertical fins and ventrals dull neutral dusky. Pectoral dull brown. Teeth whitish.

East Indies, Melanesia, Micronesia, Polynesia. Bleeker's figure agrees with our examples, though as he had only three specimens between 685 and 1,010 mm. the more developed caudal points are doubtless the result of age. Our larger examples at least show the hind nostril greatly larger than the front one, slitlike, and about two-thirds diameter of pupil. Our Cebu example greatly resembles the two examples from Zamboanga of *Callyodon margaritus*, reported by Fowler and Bean. The pale or whitish spots are about size of pupil, or some even a little larger.

8630. Biri Channel. June 1, 1909. Length, 350 mm.
8405. Cebu market. March 19, 1909. Length, 242 mm.
7534. Endeavor Strait. December 23, 1908. Length, 331 mm.
9280 and 9281. Murcielagos Bay. August 9, 1909. Length, 466 and 467 mm.
9338. Same locality. August 21, 1909. Length, 422 mm.
7674. Ulugan Bay, Palawan. December 28, 1908. Length, 434 mm.
A. 989. Binang Unang Island, Dutch East Indies. November 17, 1909. Length, 510 mm.

CALLYODON BICOLOR (Rüppell)

Scarus bicolor Rüppell, Atlas Reise Nördl. Afr., Fische, 1828, p. 82, pl. 21, fig. 3. Djedda.

Pseudoscarus bicolor Bleeker, Atlas Ichth. Ind. Néerl., vol. 1, 1862, p. 33, pl. 14 (Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 4, 1862, p. 219 (Red Sea).—Guichenot, Mem. Soc. Sci. Nat. Cherbourg, vol. 11, 1865, p. 53 (Red Sea).—Meyer, An. Soc. Hist. Nat. Madrid, vol. 14, 1885, p. 38 (Macassar).—Günther, Journ. Mus. Godeffroy, vol. 8 (16), 1909, p. 305 (Red Sea, Celebes, Ponape).—Weber, Siboga Exp., vol. 57, Fische, 1913, p. 384 (Makassar).

Pseudoscarus pulchellus var. *bicolor* KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 21, 1872, p. 560 (part).

Callyodon bicolor SNYDER, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 509 (Okinawa).

Depth 2⅗ to 2⅔; head 2⅞ to 3, width 2 1/10 to 2⅛. Snout 1 9/10 to 2, upper profile slightly concave; eye 6¼ to 7 1/10, 3 to 3⅗ in snout, 1⅘ to 2 in interorbital; mouth cleft 4 to 4½ in head; upper lip largely covers teeth; no canines; hind nostril greatly larger than front one, or length ⅗ of pupil in adult; interorbital 3½ to 3¾ in head, broadly convex. Gill rakers 7 + 13, rather firm, short points.

Scales in lateral line 17 + 5 + 2; 2 scales above lateral line, 7 below, 6 to 8 predorsal; cheek with 3 rows of rather small scales, preorbital and preopercle flange naked. Scales with 42 to 48 basal radiating striae, which crowded in each indenture of trilobate edge; apical 12 to 20; circuli fine.

D. IX, 10, 1, ninth spine 2⅖ to 2⅞ in head, first ray 2⅔ to 2¾; A. III, 9, 1, third spine 3¼ to 3⅔, first ray 2⅘ to 2⅞; caudal 1⅓ to 1⅗, emarginate; least depth of caudal peduncle 2⅙ to 2⅕; pectoral 1⅗ to 1⅔; ventral 1⅘ to 1⅞.

Back pale brown, down to 1 scale below and along lateral line, uniform. Sides and below, also posterior and lower side of head, drab; each scale with vertical dusky bar and 1 to several spots of same, and lowermost scales with dark vermiculations. Iris yellow olive. Fins dull brown, mostly uniform, lower ones or ventral and anal often neutral blackish.

Red Sea to the East Indies, Okinawa, and Micronesia. A very handsome species, with unique color pattern. Weber unites *Scarus pulchellus* Rüppell simply as a variant. Our material seems to justify its acceptance as a distinct species.

8103. Alimango Bay. March 5, 1909. Length, 303 mm.

8627. Biri Channel. June 1, 1909. Length, 275 mm.

7451. Bolalo Bay, Palawan Island. December 21, 1908. Length, 240 mm. Back yellowish gray; same color continued in center of scales on lower side, margin broadly marked dark brown; head with claret brown shades; dorsal dusky claret; caudal similar, paler in central tip; lower fins dark; pectoral bright yellow; iris orange; teeth white.

17428. Bulan Island, Samales Group. Length, 157 mm.

7682. Cagayan, Jolo. January 8, 1909. Length, 435 mm.

6702 and 8590. Catbalogan, Samar. April 15, 1908. Length, 183 to 363 mm.

7729. Caxisigan Island, near Balabac Island. January 2, 1909. Length 284 mm. Side and top of head with purplish overshades; back pale brownish olive; green of lower side and belly very dark; dorsal purplish with many small dots near base, forming broken bar; none on caudal or anal; ventrals blackish; pectorals yellow, membranes almost hyaline; teeth white.

5382. Cebu market. April 6, 1908. Length, 166 mm.

7440. Guntao Island. December 20, 1908. Length, 348 mm.

7416. Malcochin Harbor, Linapacan Island. December 18, 1908. Length, 365 mm.

7375. Port Caltom, Busuanga Island. December 15, 1908. Length, 318 mm General color red. Dull deep red in alcohol. Teeth white. Each scale with one dark spot, those on front part of body with more than one spot. Back light red. Scales on lower part with dark margin, similar to central spot. Pectoral yellowish hyaline. Caudal greenish, reddish at base.

21904. Tapiantana Island. September 13, 1909. Length 150 mm. [1929.] Top of head brownish olive, back similar but paler, fading to yellowish; scales on side below level of eye with blackish bases, remaining portion gray; lower head and breast with general slaty shade. Dorsal dark olive, with very pale margin and dusky orange inframarginal bar; large black blotch on second to fifth membranes, with obscure yellowish rim. Caudal lobes pink, area in fork white, edges of lobes slightly dusky. Anal dusky at base, yellowish terminally. Ventrals similar. Pectorals yellowish hyaline.

6412. Tilig, Lubang. July 14, 1908. Length, 380 mm.

6474 and 6475. Same locality. July 15, 1908. Length, 453 to 458 mm.

EXPLANATION OF PLATES

PLATE 1

Chromis weberi Fowler and Bean. Type.

PLATE 2

Chromis atripes Fowler and Bean. Sablayan.

PLATE 3

Chromis lineatus Fowler and Bean. Type.

PLATE 4

Chromis elerae Fowler and Bean. Type.

PLATE 5

Chromis azurelineatus Fowler and Bean. Tara Island.

PLATE 6

Chromis bitaeniatus Fowler and Bean. Type.

PLATE 7

Pomacentrus smithi Fowler and Bean. Type.

PLATE 8

Pomacentrus lepidogenys Fowler and Bean. Type.

PLATE 9

Pomacentrus reidi Fowler and Bean. Type.

PLATE 10

Pomacentrus stigma Fowler and Bean. Type.

PLATE 11

Pomacentrus pristiger Valenciennes. Variant. Dalanganem Island.

PLATE 12

Pomacentrus pristiger Valenciennes. Variant. Tataan Island.

PLATE 13

Pomacentrus beauforti Fowler and Bean. Type.

PLATE 14

Abudefduf thoracotaeniatus Fowler and Bean. Type.

PLATE 15

Abudefduf bleekeri Fowler and Bean. Type.

PLATE 16

Choerodon melanostigma Fowler and Bean. Type.

PLATE 17

Wetmorella philippina Fowler and Bean. Type.

PLATE 18

Labroides bicolor Fowler and Bean. Type.

PLATE 19

Variation of *Halichoeres centriquadrus* (Lacépède).

PLATE 20

Variation of *Halichoeres centriquadrus* (Lacépède).

PLATE 21

Variation of *Halichoeres scapularis* (Bennett).

PLATE 22

Variation of *Macropharyngodon* Geoffroy (Quoy and Gaimard) and *Halichoeres scapularis* (Bennett).

Upper two figures and upper median figure to left *Macropharyngodon*, others *Halichœres*.

PLATE 23

Variation of *Halichoeres melanurus* (Bleeker).

PLATE 24

Halichoeres richmondi Fowler and Bean. Type.

PLATE 25

Halichoeres melanochir Fowler and Bean. Paratype.

PLATE 26

Variation of *Halichoeres hoevenii* (Bleeker).

PLATE 27

Variation of *Halichoeres nebulosus* (Valenciennes).

PLATE 28

Halichoeres desmogenys Fowler and Bean. Type.

PLATE 29

Variation of *Halichoeres desmogenys* Fowler and Bean.

PLATE 30

Variation of *Halichoeres papillionaceus* (Valenciennes).

PLATE 31

Variation of *Halichoeres nigrescens* (Schneider).

PLATE 32

Variation of *Halichoeres vicolor* (Schneider).

PLATE 33

Variation of *Halichoeres amboinensis* (Bleeker) and *Halichoeres marginatus* Rüppell.

Upper four figures and lower median left figure *Halichoeres amboinensis*, others *Halichoeres marginatus*.

PLATE 34

Halichoeres tenuispinis (Günther). Palawan.

PLATE 35

Variation of *Halichoeres tenuispinis* (Günther).

PLATE 36

Variation of *Halichoeres argus* (Schneider).

PLATE 37

Variation of *Halichoeres argus* (Schneider) and *Halichoeres leparensis* (Bleeker).

Upper right and lower right figures *Halichoeres argus*, others *Halichoeres leparensis*.

PLATE 38

Variation of *Halichoeres gymnocephalus* (Schneider).

PLATE 39

Variation of *Halichoeres podostigma* (Bleeker).

PLATE 40

Halichoeres leucostigma Fowler and Bean. Type.

PLATE 41

Variation of *Coris* and *Halichoeres*.

Two upper figures and upper median left figure *Coris batuensis* (Bleeker); upper median right figure *Halichoeres desmogenys* Fowler and Bean; lower median right and left figures *Halichoeres leucurus* (Walbaum); two lower figures *Halichoeres reichei* (Bleeker).

PLATE 42

Coris philippina Fowler and Bean. Type.

PLATE 43

Variation of *Thalassoma hardwicke* (Bennett). The blue black blotches on the head are shown white, as they often fade gray or lighter than the ground color.

PLATE 44

Cheilinus rostratus Cartier. Powuti Harbor, Makyan Island.

PLATE 45

Callyodon margaritus (Cartier).

PLATE 46

Variation of *Callyodon sordidus* (Forskål) and *Callyodon dussumieri* (Valenciennes).

Two left figures *Callyodon dussumieri*; others *Callyodon sordidus*.

PLATE 47

Callyodon lineolabiatus Fowler and Bean. Type.

PLATE 48

Callyodon viridibusius Fowler and Bean. Type.

PLATE 49

Callyodon vermiculatus Fowler and Bean. Type.

PLATES

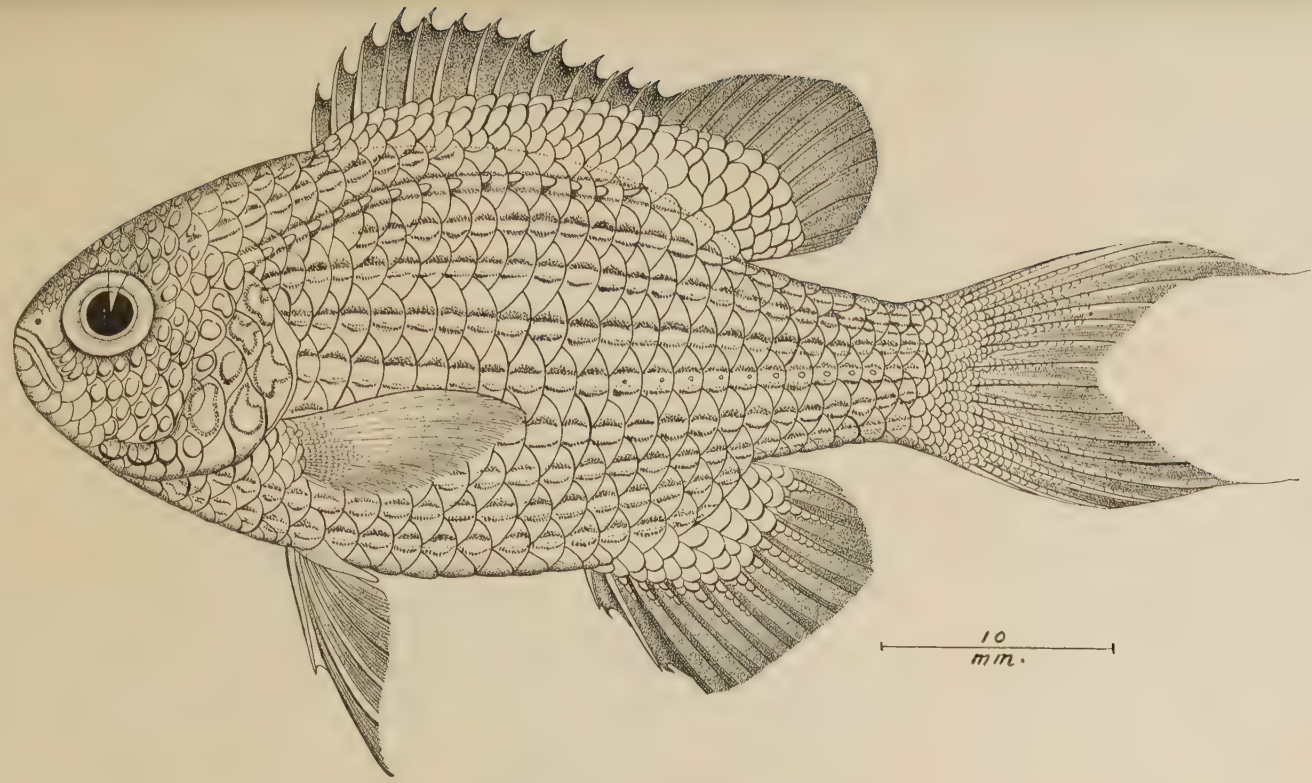
CHROMIS WEBERI FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 41

32872—28——33

CHROMIS ATRIPES FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 43



CHROMIS LINEATUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 50

CHROMIS ELERAE FOWLER AND BEAN

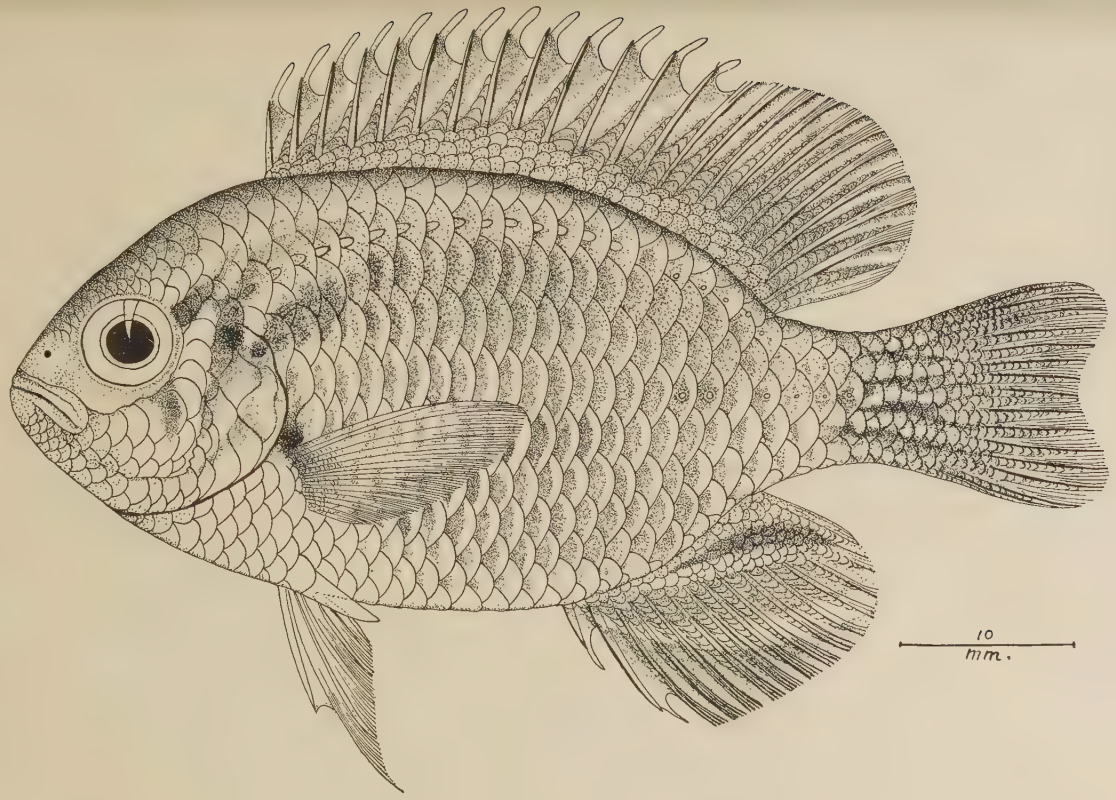
FOR EXPLANATION OF PLATE SEE PAGE 52

CHROMIS AZURELINEATUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 67

CHROMIS BITAENIATUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 68



POMACENTRUS SMITHI FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 75

POMACENTRUS LEPIDOGENYS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 98

POMACENTRUS REIDI FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 99

POMACENTRUS STIGMA FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 100

POMACENTRUS PRISTIGER VALENCIENNES. VARIANT

Dalangamen Island

FOR EXPLANATION OF PLATE SEE PAGE 109

POMACENTRUS PRISTIGER VALENCIENNES. VARIANT
Tataan Island

POMACENTRUS BEAUFORTI FOWLER AND BEAN.

FOR EXPLANATION OF PLATE SEE PAGE 115

ABUDEFDUF THORACOTAENIATUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 168

ABUDEFDUF BLEEKERI FOWLER AND BEAN. TYPE

FOR EXPLANATION OF PLATE SEE PAGE 165

CHOERODON MELANOSTIGMA FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 199

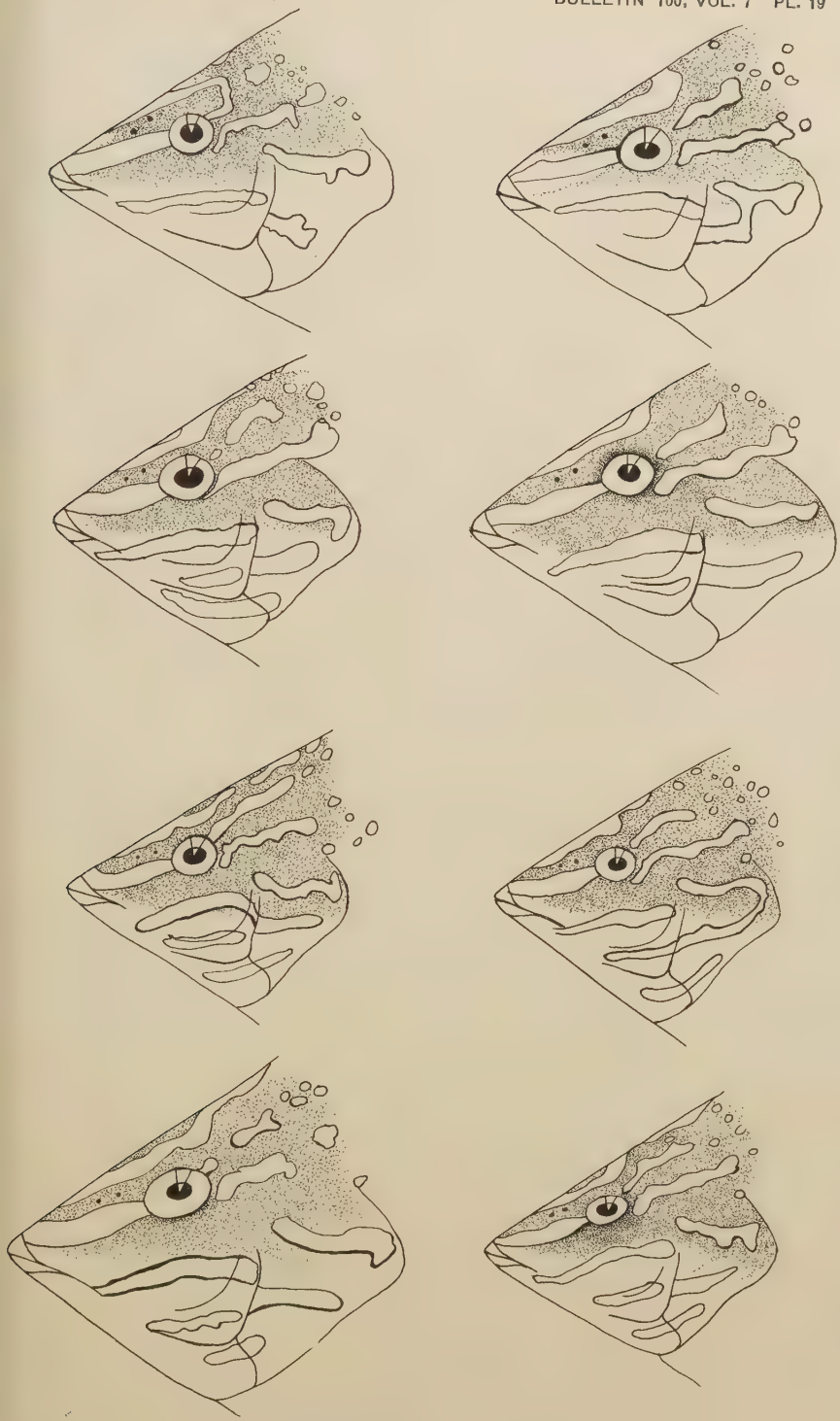
WETMORELLA PHILIPPINA FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 211

32872—28——34

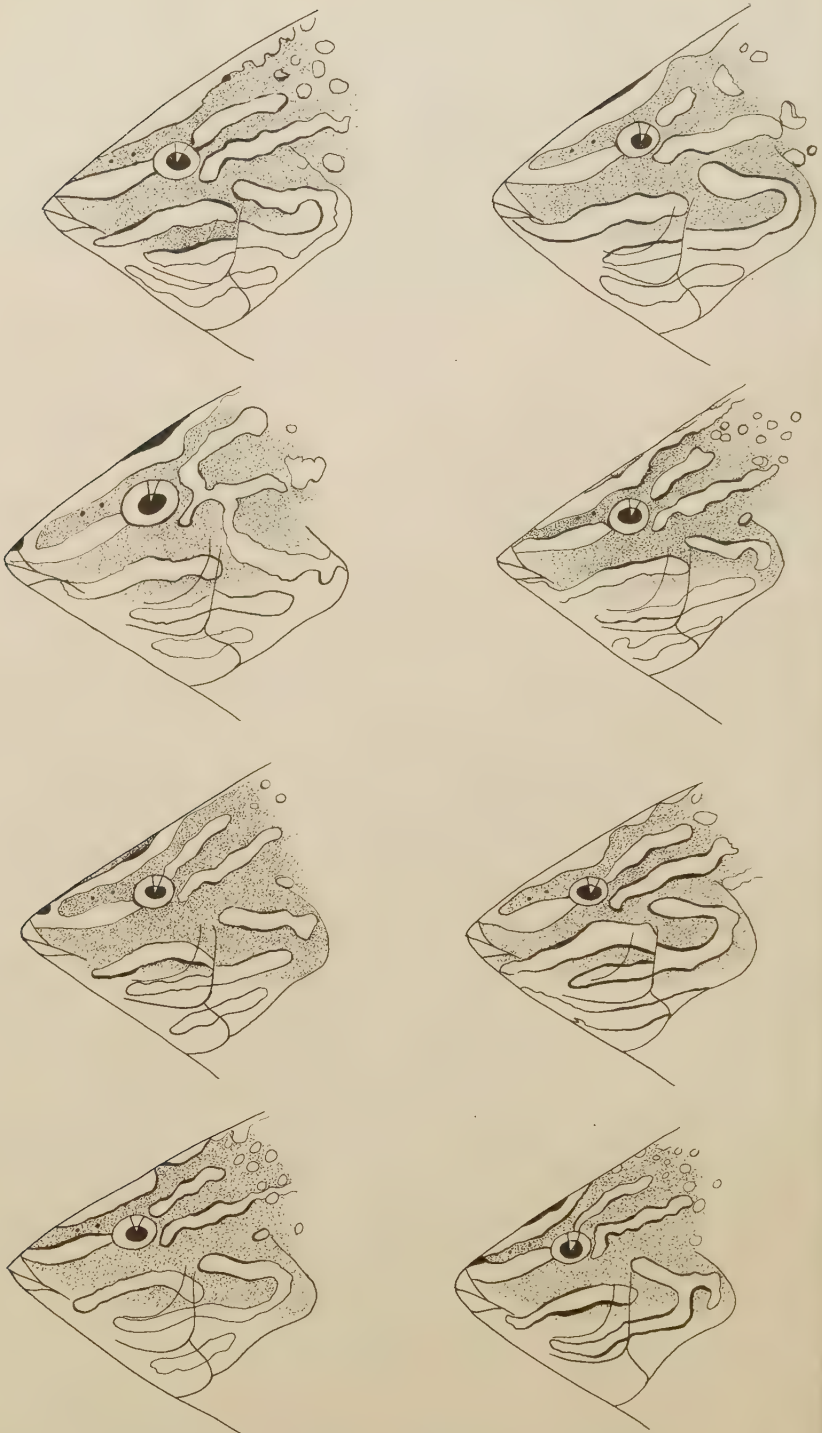
LABROIDES BICOLOR FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 224



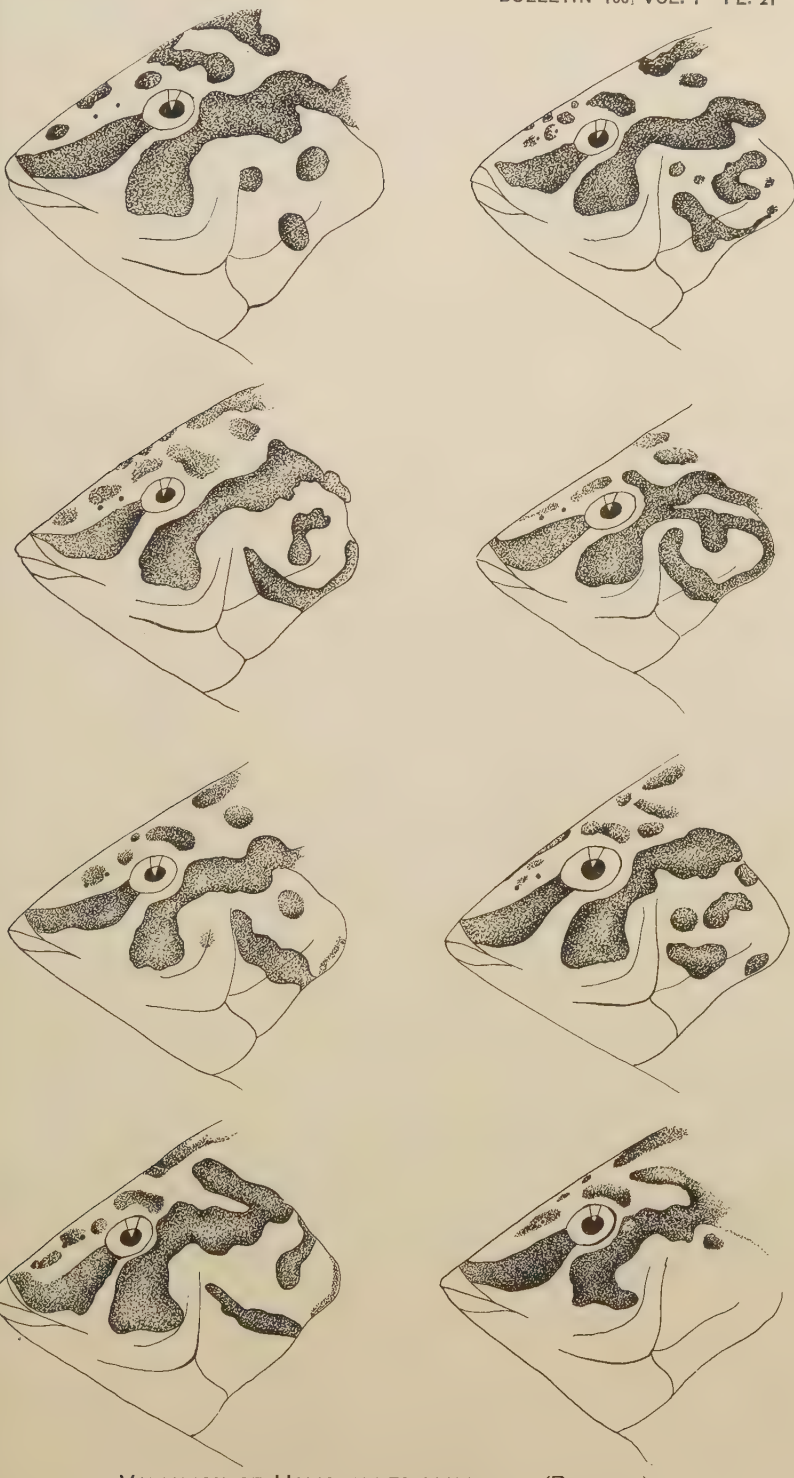
VARIATION OF HALICHOERES CENTRIQUADRUS (LACÉPÈDE)

FOR EXPLANATION OF PLATE SEE PAGE 253



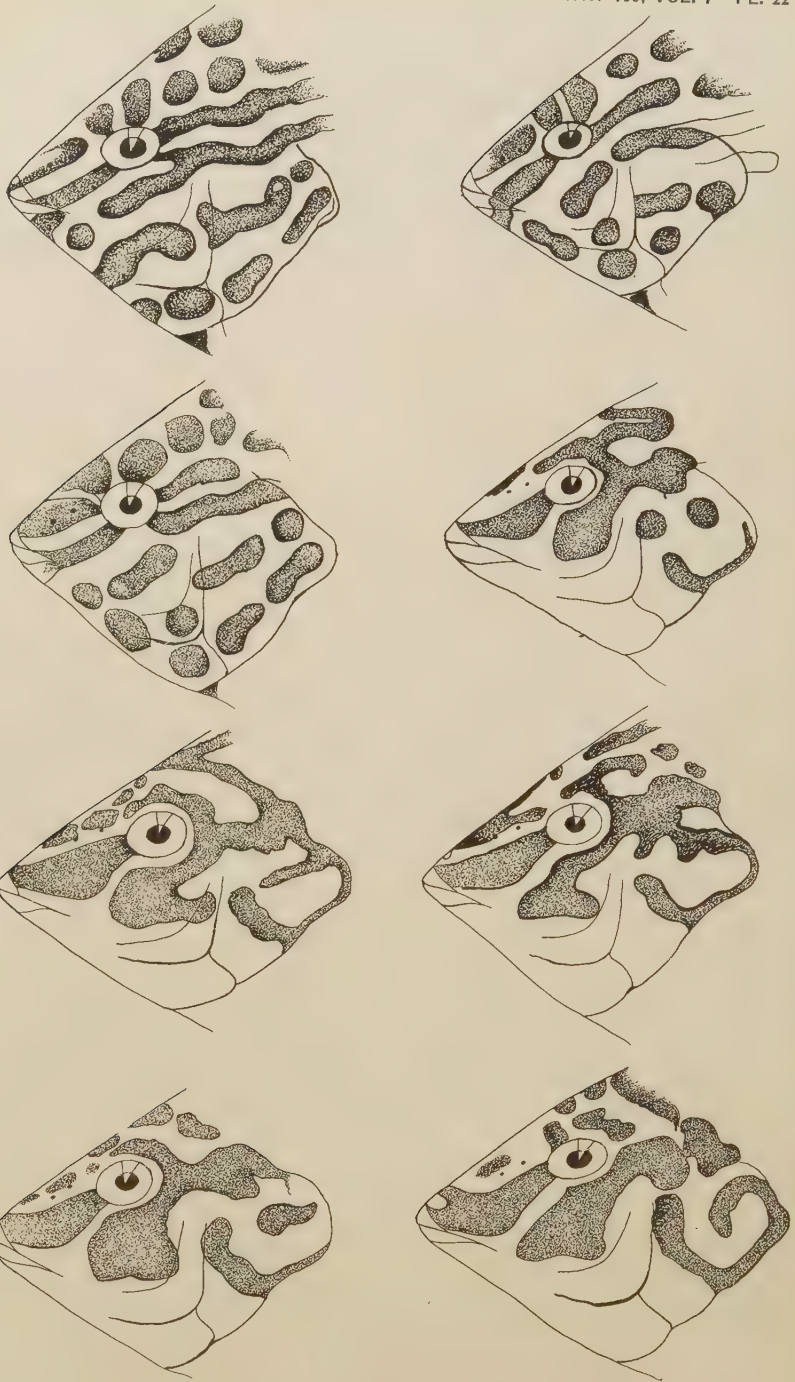
VARIATION OF HALICHOERES CENTRIQUADRUS (LACÉPÈDE)

FOR EXPLANATION OF PLATE SEE PAGE 253



VARIATION OF HALICHOERES SCAPULARIS (BENNETT)

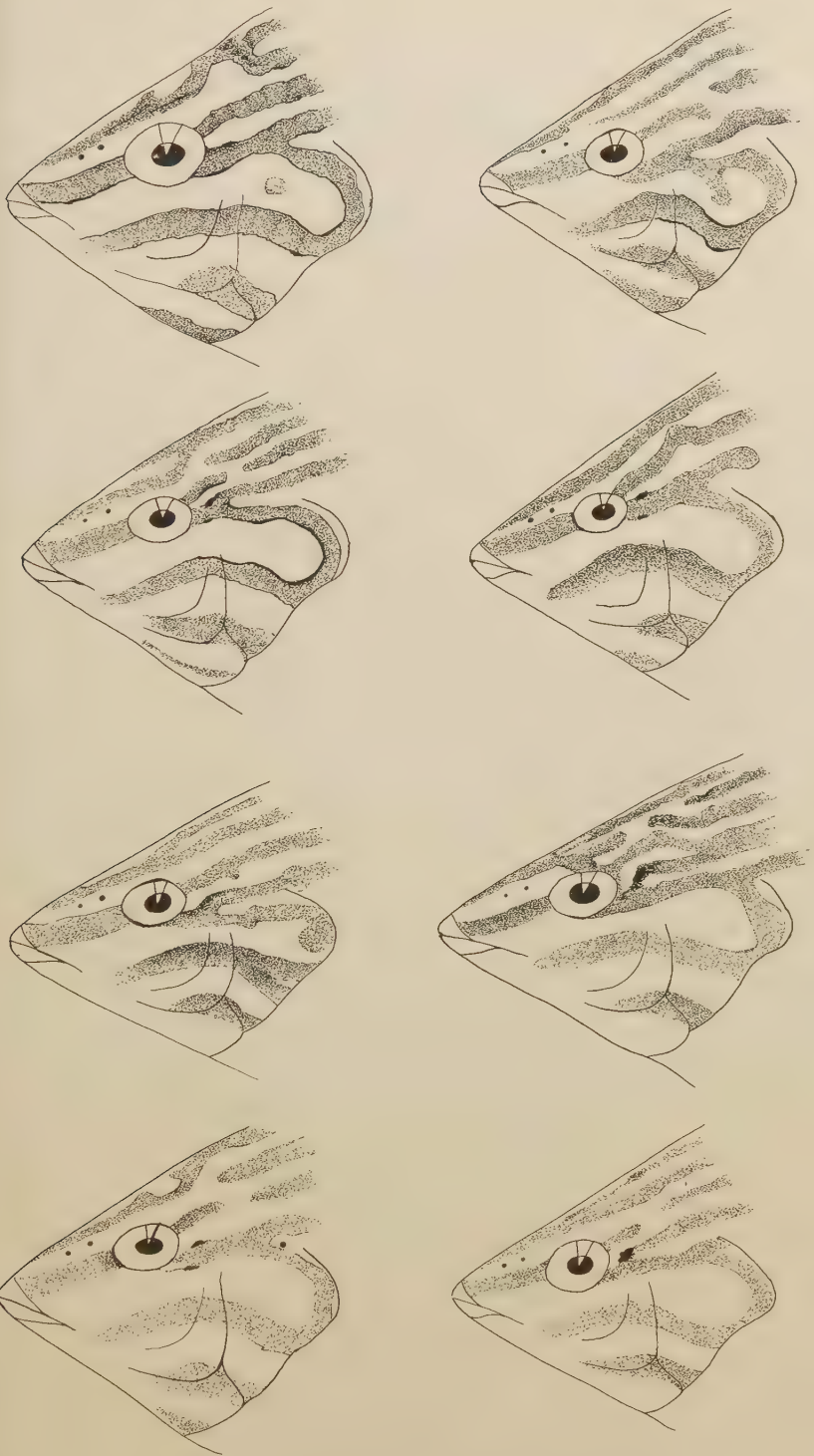
FOR EXPLANATION OF PLATE SEE PAGE 255



VARIATION OF MACROPHARYNGODON GEOFFROY (QUOY AND GAIMARD) AND HALICHOERES SCAPULARIS (BENNETT)

Upper two figures and upper median figure to left, *Macropharyngodon*, others *Halichoeres*

FOR EXPLANATION OF PLATE SEE PAGES 255, 299, AND 500



VARIATION OF HALICHOERES MELANURUS (BLEEKER)

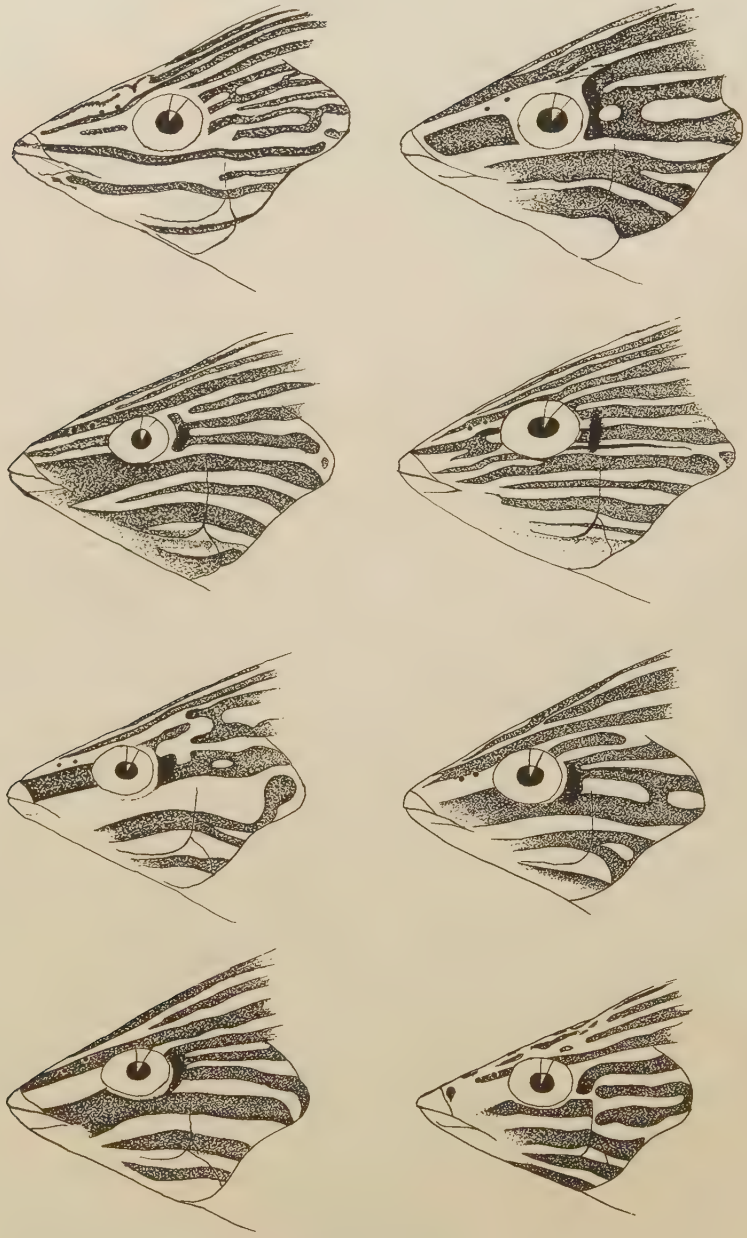
FOR EXPLANATION OF PLATE SEE PAGE 262

HALICHOERES RICHMONDI FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 283

HALICHOERES MELANOCHIR FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 264



VARIATION OF HALICHOERES HOEVENII (BLEEKER)

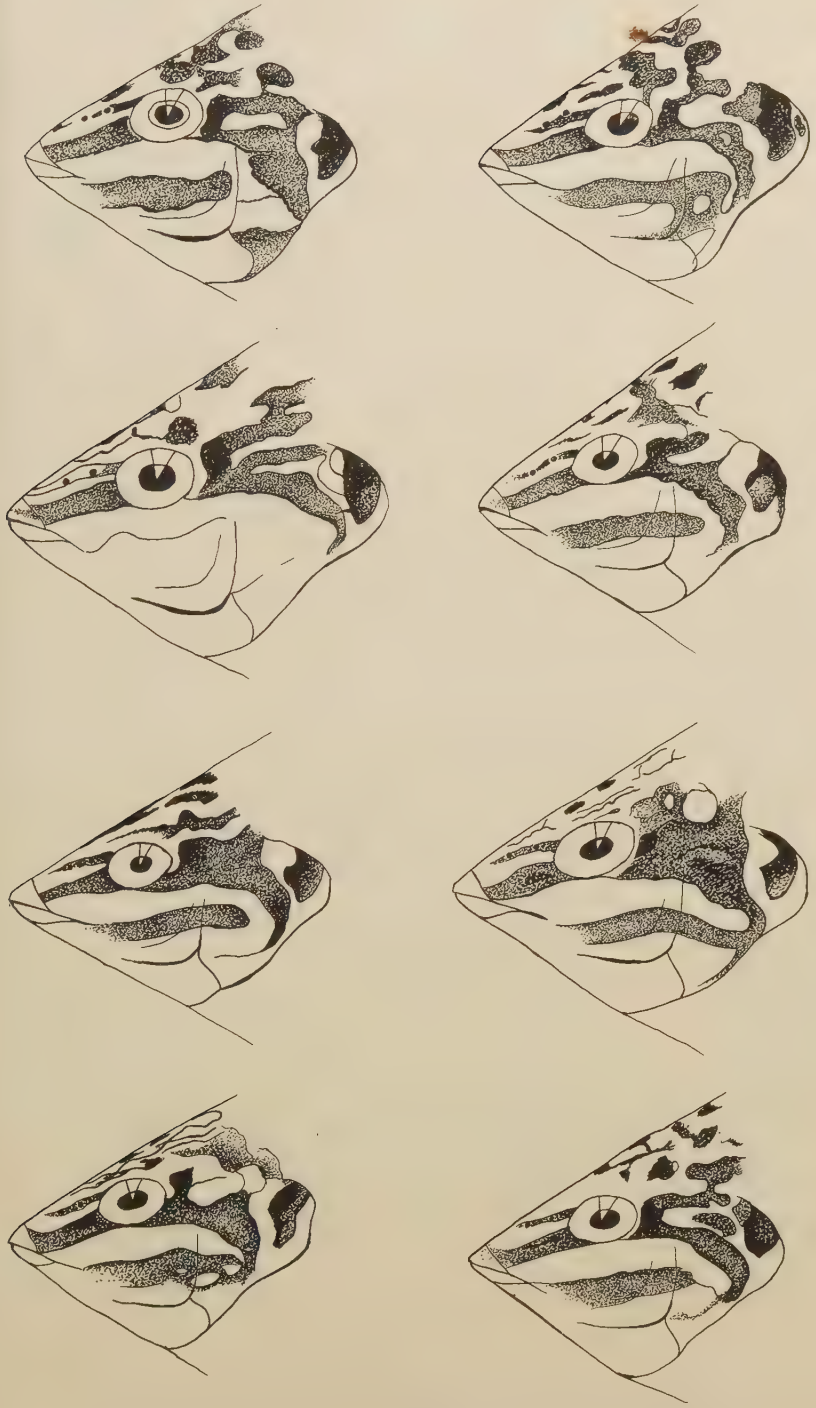
FOR EXPLANATION OF PLATE SEE PAGE 268

VARIATION OF HALICHOERES NEBULOSUS (VALENCIENNES)

FOR EXPLANATION OF PLATE SEE PAGE 273

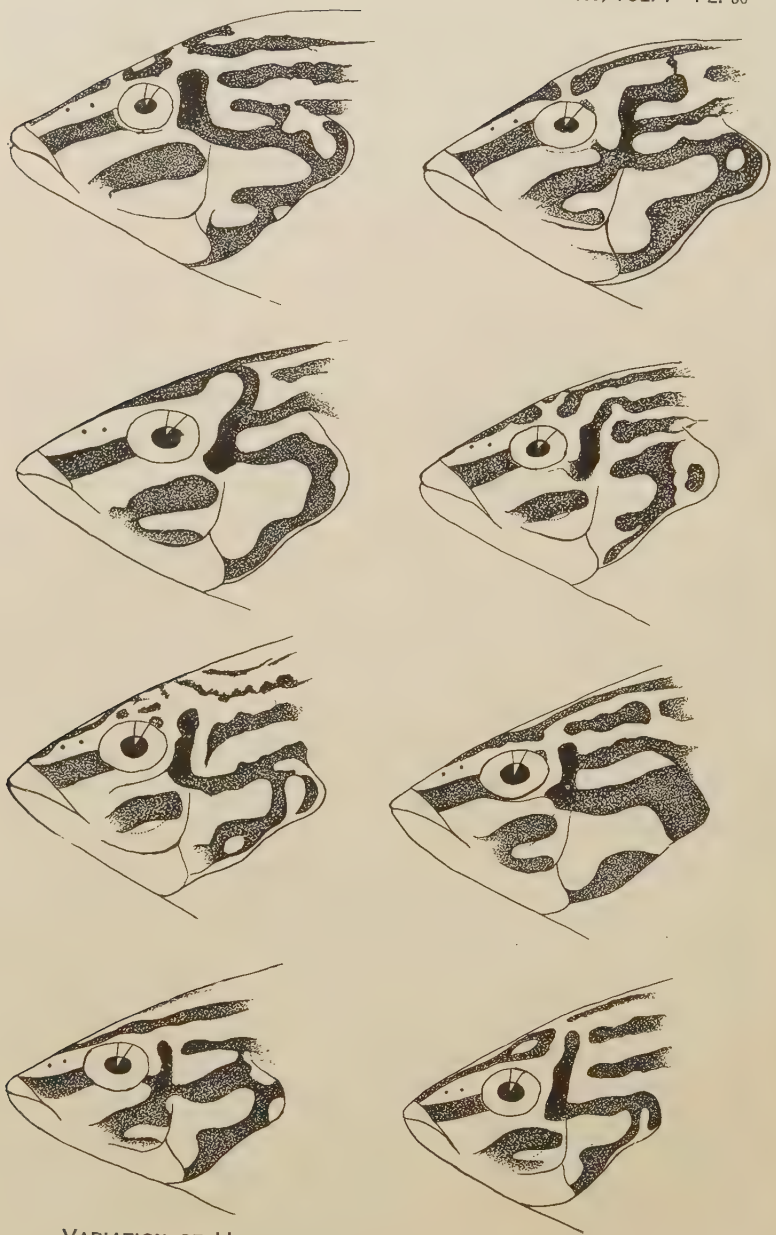
HALICHOERES DESMOGENYS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 276



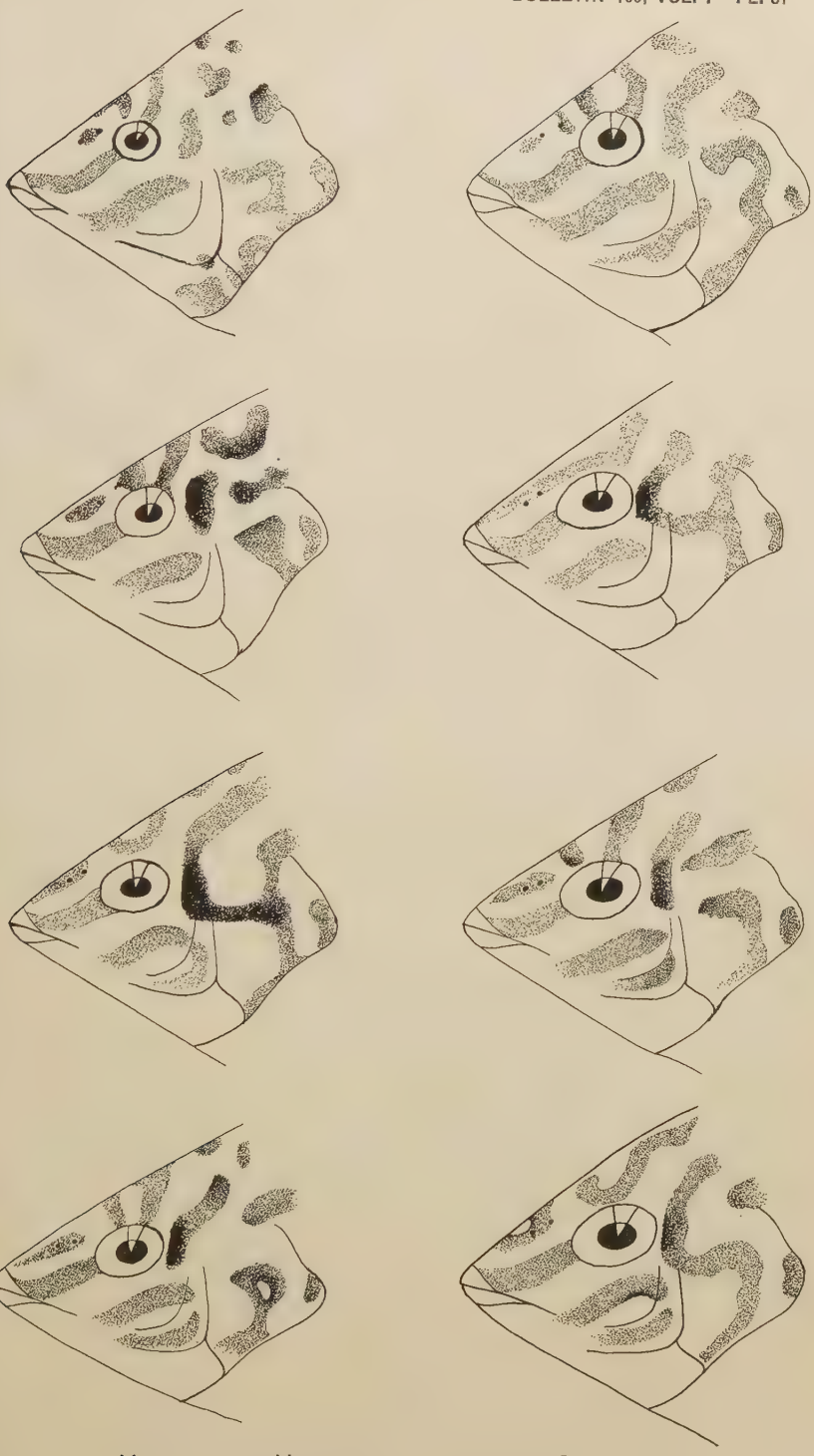
VARIATION OF HALICHOERES DESMOGENYS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 276



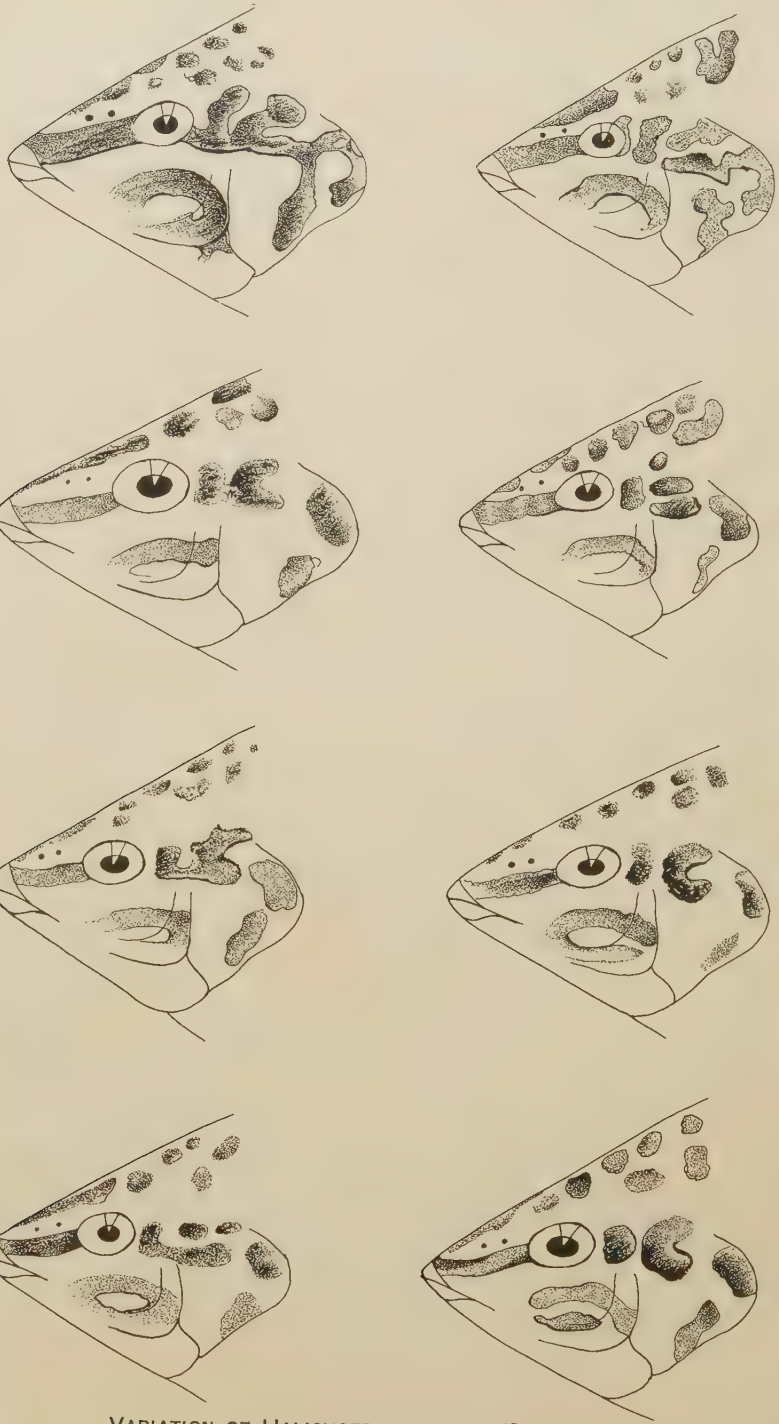
VARIATION OF HALICHOERES PAPILLIONACEUS (VALENCIENNES)

FOR EXPLANATION OF PLATE SEE PAGE 278



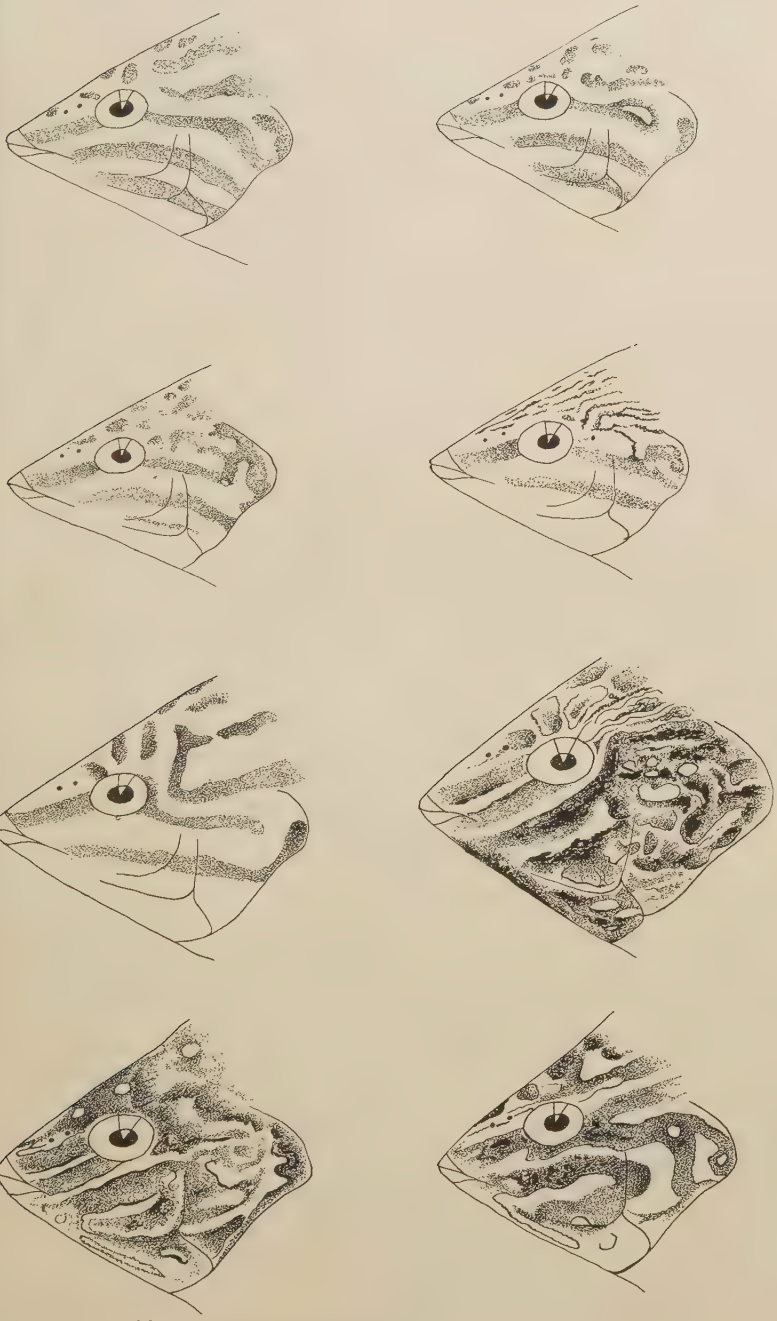
VARIATION OF HALICHOERES NIGRESCENS (SCHNEIDER)

FOR EXPLANATION OF PLATE SEE PAGE 280



VARIATION OF HALICHOERES BICOLOR (SCHNEIDER)

FOR EXPLANATION OF PLATE SEE PAGE 282



VARIATION OF HALICHOERES AMBOINENSIS (BLEEKER) AND H. MARGINATUS RÜPPELL

Upper four figures and lower median left figure *Halichoeres amboinensis* others *Halichoeres marginatus*

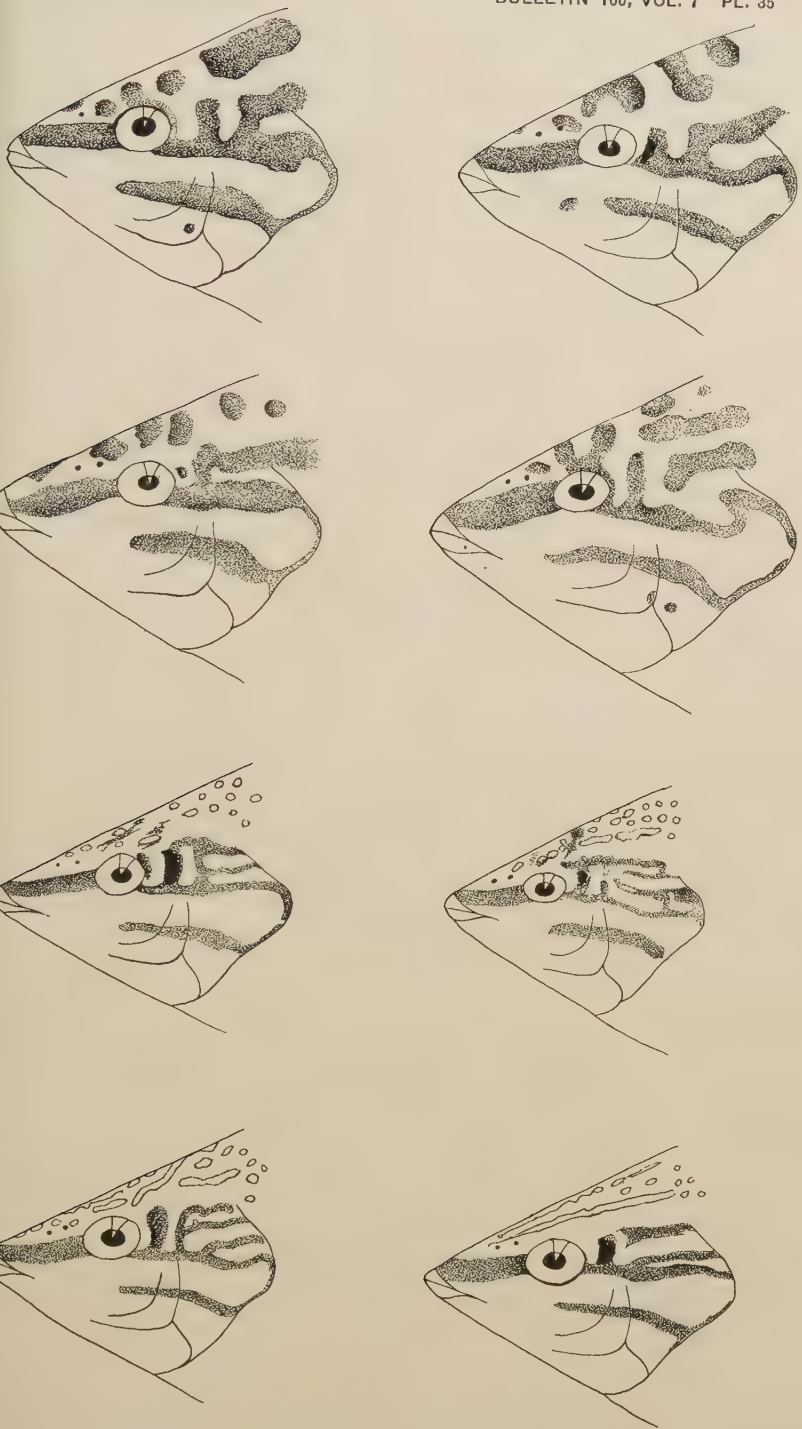
FOR EXPLANATION OF PLATE SEE PAGES 265, 288 AND 501

32872—28——35

HALICHOERES TENUISPINIS (GÜNTHER)

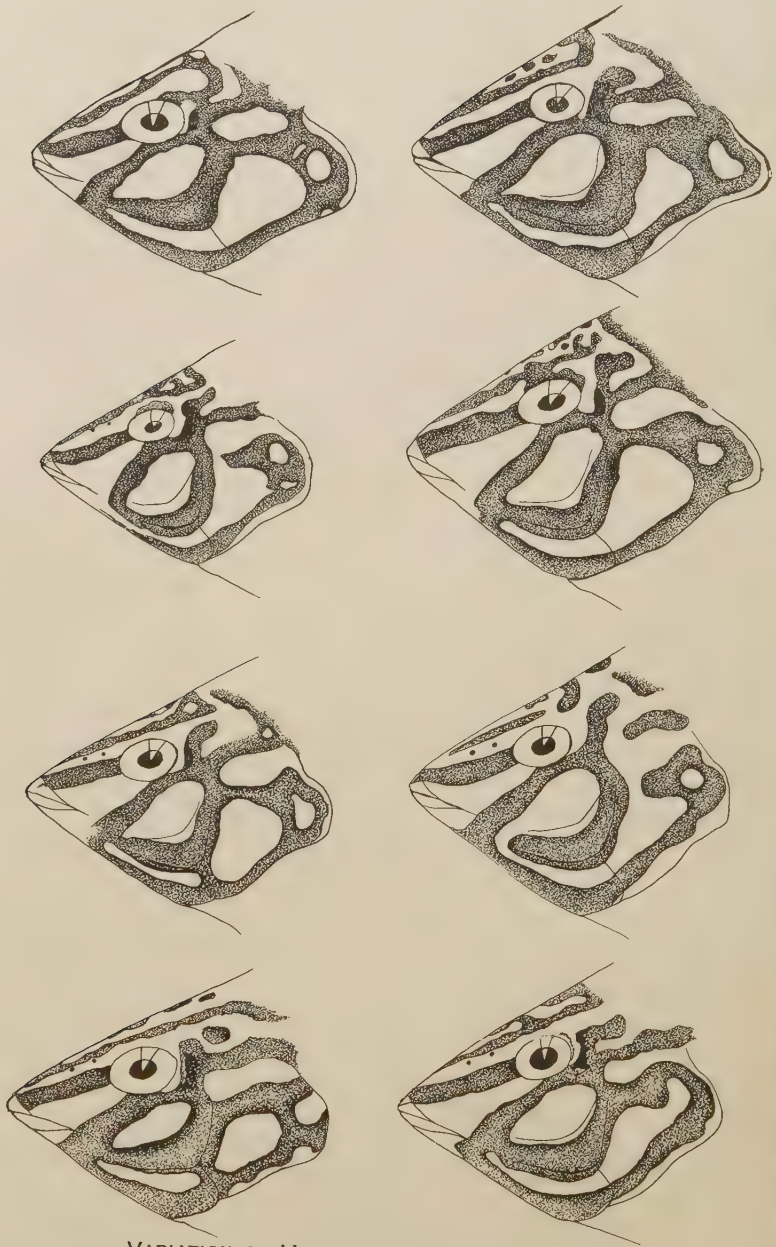
Palawan

FOR EXPLANATION OF PLATE SEE PAGE 288



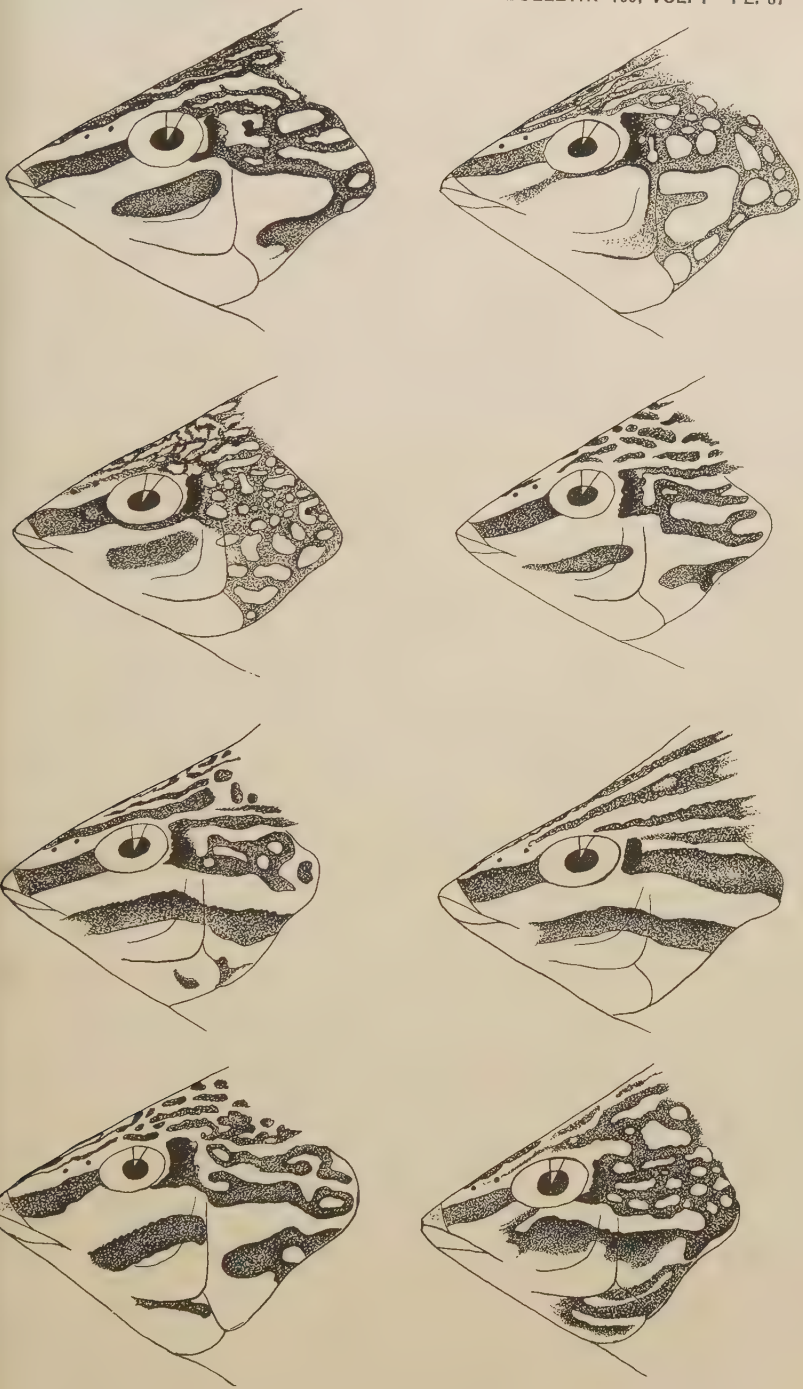
VARIATION OF HALICHOERES TENUISPINIS (GÜNTHER)

FOR EXPLANATION OF PLATE SEE PAGE 288



VARIATION OF HALICHOERES ARGUS (SCHNEIDER)

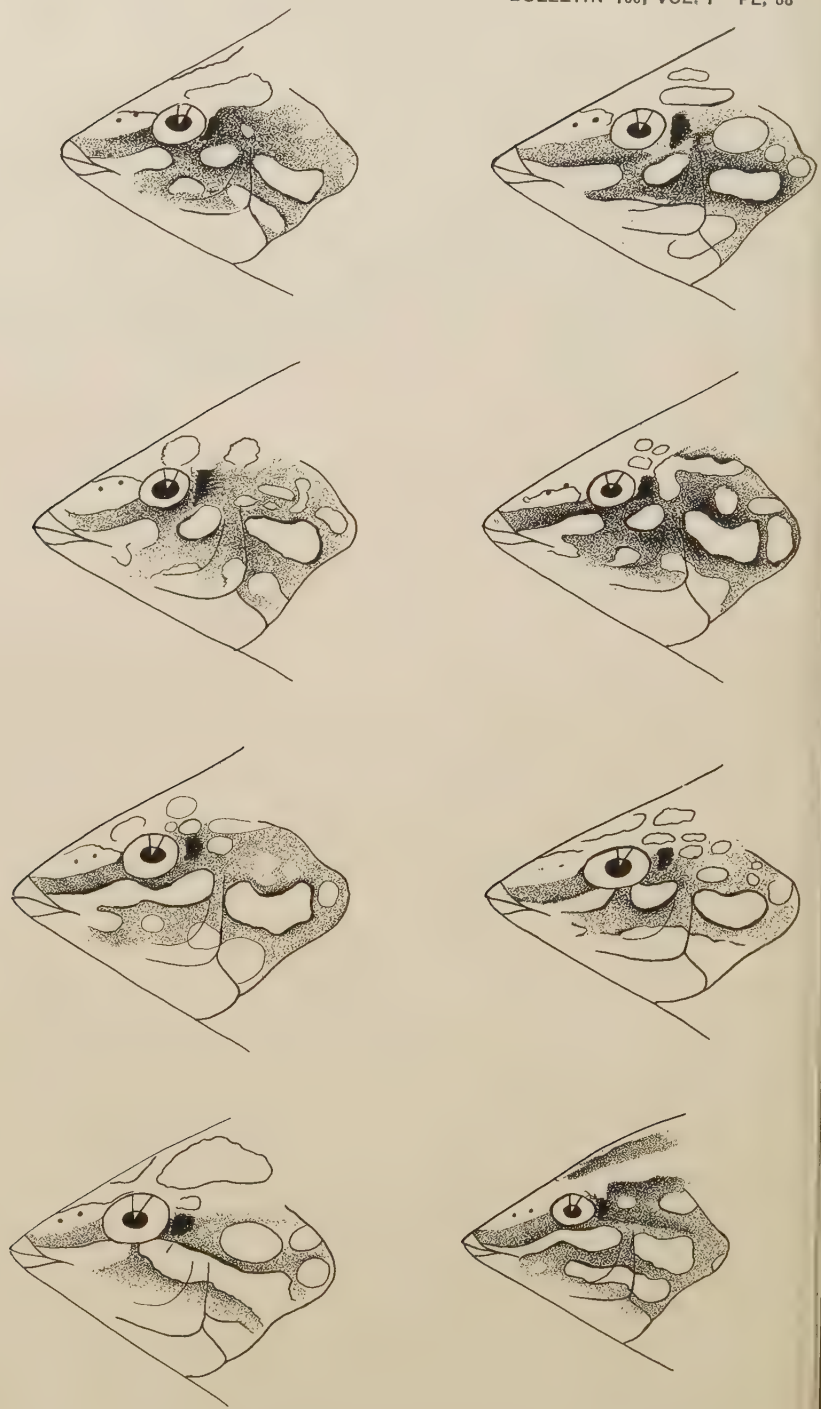
FOR EXPLANATION OF PLATE SEE PAGE 292



VARIATION OF HALICHOERES ARGUS (SCHNEIDER) AND H. LEPARENSIS (BLEEKER)

Upper right and lower right figures *Halichoeres argus;* other *Halichoeres leparensis*

FOR EXPLANATION OF PLATE SEE PAGES 283, 292 AND 501



VARIATION OF HALICHOERES GYMNOCEPHALUS (SCHNEIDER)

FOR EXPLANATION OF PLATE SEE PAGE 296

VARIATION OF HALICHOERES PODOSTIGMA (BLEEKER)

FOR EXPLANATION OF PLATE SEE PAGE 297

HALICHOERES LEUCOSTIGMA FOWLER AND BEAN. TYPE

FOR EXPLANATION OF PLATE SEE PAGE 299

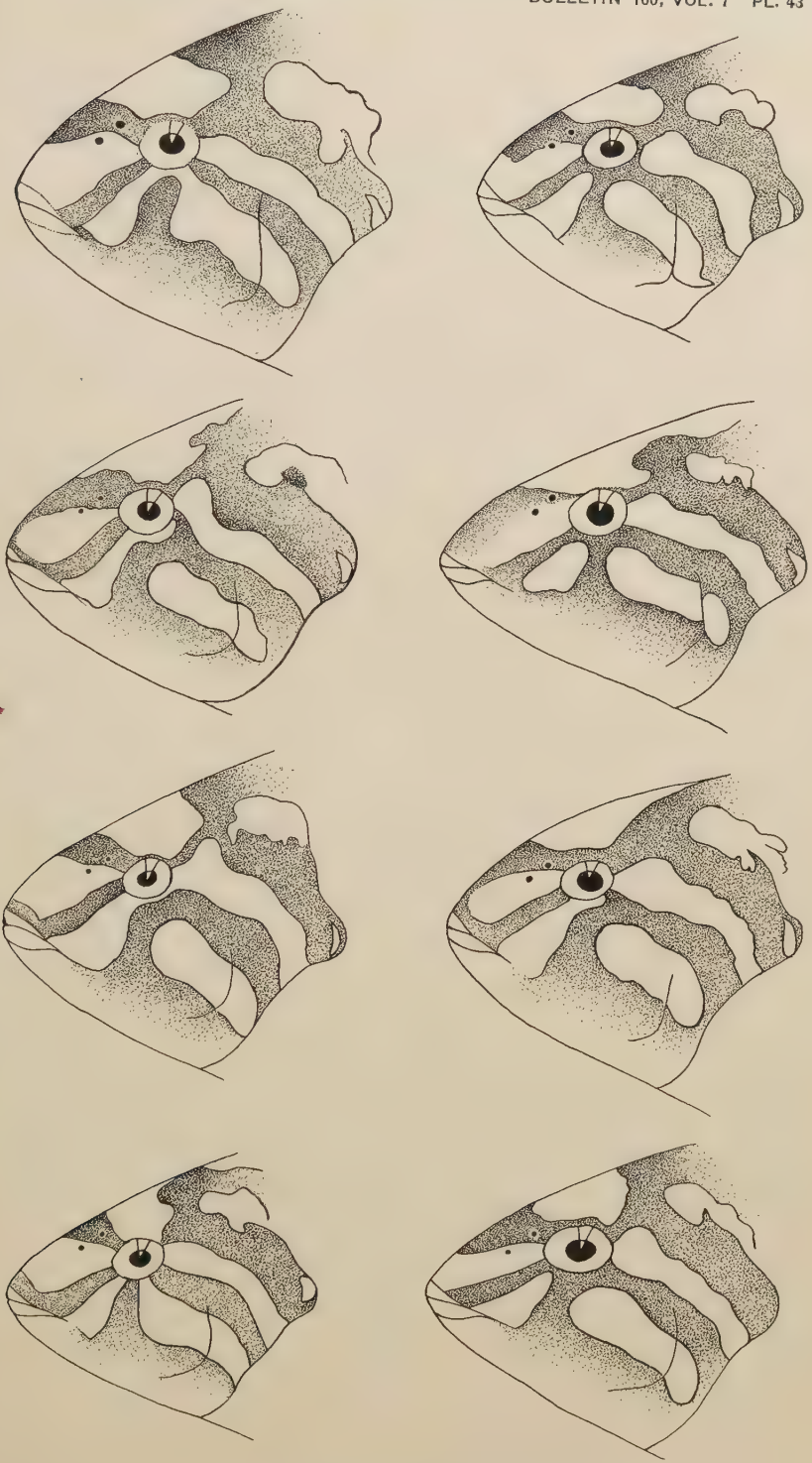
VARIATION OF CORIS AND HALICHOERES

Two upper figures and upper median left figure *Coris batuensis* (Bleeker); upper median right figure *Halichoeres desmogenys*, Fowler and Bean; lower median right and left figures *Halichoeres leucurus* (Walkbaum); two lower figures *Halichoeres reichei* (Bleeker)

FOR EXPLANATION OF PLATE SEE PAGES 250 AND 302

CORIS PHILIPPINA FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 309



VARIATION OF THALASSOMA HARDWICKE (BENNETT)

The blue black blotches on this head are shown white, as they often fade gray or lighter than the ground color

FOR EXPLANATION OF PLATE SEE PAGE 317

CHEILINUS ROSTRATUS CARTIER

Powati Harbor, Makyon Island

FOR EXPLANATION OF PLATE SEE PAGE 358

CALLYODON MARGARITUS (CARTIER)

FOR EXPLANATION OF PLATE SEE PAGE 397

VARIATION OF CALLYODON DUSSUMIERI (VALENCIENNES) AND C. SORDIDUS (FORSKL)

The two left figures are *Callyodon dussumieri* and the others *Callyodon sordidus*

FOR EXPLANATION OF PLATE SEE PAGES 399 AND 449

CALLYODON LINEOLABIATUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 467

CALLYODON VIRIDIBUSIUS FOWLER AND BEAN

FOR EXPLANATION OF PLATE SEE PAGE 459

CALLYODON VERMICULATIS FOWLER AND BEAN. TYPE

FOR EXPLANATION OF PLATE SEE PAGE 472

32872—28——36

INDEX

[The page numbers of the principal entries are set in heavy-faced type]

Page

abacurus, Callyodon 399
Pseudoscarus 399
abu-dafar, Chaetodon 23
Abudefduf 121
albofasciatus 178
amabilis 177
anabatoides 183, 184
antjerius 146, 147, 166
aureus 142, 150
azurepunctatus 149
azysron 181
bankieri 72, 99, 181, 182, 183
behnii 160
bengalensis 125, 128, 135
biocellatus 166
bleekeri 165
bonang 154
brownriggii 166
var. zonatus 179
caesio 170
clarki 136, 137
coelestinus 130
coelestinus 130
coracinus 160, 161
corneyi 160
curacao 138
cyaneus 168
dickii 53, 147
glaucus 80, 169, 180
hemicyaneus 165
jordani 27
lacrymatus 151
leucogaster 138, 142, 171
leucozona 149, 154, 180
leucozonus 149
melanocarpus 182
melanopselion 185, 187
melas 161
modestus 170
notatus 136
oxyodon 164
parasema 175, 177
philippinus 138, 142
rhomaleus 161
richardsoni 184
sapphirus 175, 177
saxatilis 124, 125, 129, 131, 137, 138, 142
saxatilis 125
septemfasciatus 125, 127, 129, 131, 135, 137
sexfasciatus 129, 137
sordidus 132, 133, 137
taupou 168, 169
thoracotaeniatus 158
turchesius 168, 169
unimaculatus 71, 145, 170, 171

Page

Abudefduf—Continued.
uniocellatus 173
xanthonotus 159
xanthurus 42, 155
zonatus 170, 171, 179
abudjubbe, Cheilinus 348
Acanthochromis 27
polyacanthus 27
Acarauna 331
longirostris 331
Actinochromis 30
aculeata, Scorpaena 4
aeruginosus, Pseudoscarus 473, 474
Scarus 473, 474
affinis, Glyphidodon 128
albifasciatus, Pomacentrus 65
albipunctatus, Callyodon 397
albisella, Dascyllus 14, 17
albocinctus, Glyphidodon 179
Glyphodon 179
albofasciatus, Abudefduf 178
Eupomacentrus 117
Glyphidodon 178
Glyphidodontops 178
Glyphisodon 178
Pomacentrus 104
albotaeniatus, Cossyphus 207
Lepidaplois 207
albovittata, Stethojulis 241
albovittatus, Labrus 241
alexanderae, Pomacentrus 81, 86
alternans, Platyglossus 256
altipinis, Pseudoscarus 444
amabilis, Abudefduf 177
Glyphisodon 177
amblycephalus, Julis 330
Julis (Julis) 330
Thalassoma 330
Amblyglyphidodon 122
Amblypomacentrus 65
breviceps 114
amboinensis, Chromis 35
Duymaeria 215, 216
Glyphidodon 73
Glyphisodon 73
Halichoeres 288, 289
Heliases 35
Julis (Halichoeres) 288
Platyglossus 288
Pomacentrus 86
(Pseudopomacentrus) 86
Ampheces 224
pterophthalmus 225
Amphiprion 6
bicinctus 7

	Page
Amphiprion—Continued.	
bicolor	12
bifasciatus	6
boholensis	7
chrysargyrus	7
chrysopterus	7
clarckii	7
clarki	7
var. japonicus	7
clarkii var chrysarurus	7
ephippium	7
frenatus	9
intermedius	6
japonicus	7
melanurus	12
mylii	7
ocellaris	12
percula	11
polylepis	9
polymnus	6, 7
sebae	6
snyderi	7
tricolor	9, 10
tunicatus	12
xanthurus	7
anabatoides, Abudefduf	183, 184
Glyphidodon	61, 183
Glyphisodon	183
Pomacentrus	41, 43, 183
Pomacentrus (Pseudopomacentrus)	183
analis, Chromis	60, 138, 142
Heliases	60
Heliastes	60
Pomacentrus	81
Anampses	210, 224
à bandes	230
caeruleopunctatus	228
caeruleo-punctatus	228
chlorostigma	229
coeruleomaculatus	229
coeruleopunctatus	229
diadematus	230
geographicus	224, 226
lineolatus	226
meleagrides	227
meleagris	227
pterophthalmus	225
pulcher	229
taeniatus	230
Anampsis	224
anchorago, Choerodon	193
Choerops	193
Choirodon	193
Cossyphus	193
Sparus	193
andjerinus, Glyphisodon	166
aneitense, Julis	327
Thalassoma	327
angulata, Coris	303, 304
angulatus, Coris	303
Glyphisodon	54
anjerius, Glyphidodon	166
annularis, Julis	250, 265
annulata, Coris	313
annulatus, Halichoeres	273, 275
Julis	313
Labrus	313
Anthias clarkii	7
polymnus	6, 12
anthioides, Cossyphus	201
Antinicola	6
antjerius, Abudefduf	146, 147, 166
Glyphidodon	166
Glyphidodontops	166
Glyphisodon	166
Apogon quinquevittatus	125
aquilolo, Marcropharyngodon	300
arabicus, Trichopus	322
arago, Labrus	366
Xyrichthys	366
araneus, Chaetodon	23
arcuatum, Tetradrachmum	22
arcuatus, Chaetodon	13, 22
arenatus, Cheilinus	343
argus, Halichoeres	292
Julis	292
Labrus	292
aruanum, Tetradrachmum	22
aruanus, Chaetodon	13, 21
Chetedon	21
Dascyllus	21, 22
Lutjanus	22
Pomacentrus	22
assimilis, Glyphidodon	174
ater, Eupomacentrus	81
Glyphisodon	161
Pomacentrus	81
atripes, Chromis	43
atrolumbus, Cossyphus	206
augustinus, Pseudoscarus	474
auratus, Cheilio	335, 339
aureus, Abudefduf	142, 150
Epibulus	213
Glyphidodon (Amblyglyphidodon)	142
Glyphisodon	122, 142
aurigaria, Crenilabrus	215
Duymaeria	216
aurigarius, Ctenolabrus	216
auritum, Choerops	374
auritus, Scarichthys	373
Scarus	373
auromaculatus, Labrus	303
australis, Labrichthys	220
axillaris, Heliastes	44
Julis	231, 234
Labrus	201
Stethojulis	234
Aygula	302
aygula, Coris	302, 303
Julis	303
Ayresia	30
punctipinnis	30
azurelineatus, Chromis	57
azurepunctatus, Abudefduf	149
azures, Glyphidodon	168
Glyphisodon	122, 168
azurio, Choerodon	192
Choerops	192
Choirodon	192
azysron, Abudefduf	181
Pomacentrus	181
Pomacentrus (Pomacentrus)	181
balinensis, Callyodon	410, 414, 457, 474, 484
Glyphisodon	166

Page

balinensis—continued.
Pseudoscarus 457
Scarus 457
ballieui, Julis 331
Thalassoma 331
balteatus, Julis 241
bandanensis, Glyphisodon 61
Julis (Halichoeres) 235
Stethojulis 235
bandes, Anampses 230
bankanensis, Pomacentrus 90
bankieri, Abudefduf 72, 99, 181, 182, 183
Glyphidodon 181
Glyphisodon 181
Parapomacentrus 182
bataviensis, Callyodon 410, 414
Scarus 410, 414
batuensis, Coris 306
Hemicoris 306
Julis (Halichoeres) 306
beauforti, Pomacentrus 115
behnii, Abudefduf 160
Glyphidodon 160
Glyphisodon 160
Paraglyphidodon 160
bengalensis, Abudefduf 125, 128, 135
Chaetodon 128
Glyphidodon 128
Glyphidodon (Glyphidodon) 128
Glyphisodon 128
bennetti, Scarus 174
beraber, Julis 247
Bermudichthys 315
subfurcatus 315
biaculeatus, Chaetodon 4
Holacanthus 4
Premnas 4
bicinctus, Amphiprion 7
bicolor, Amphiprion 12
Callyodon 496, 497
Cheilio 336
Choerojulis 282
Glyphidodon 45
Halichoeres 282
Labrichthys 247
Labroides 224
Labrus 282
Platyglossus 282
Pseudoscarus 423, 496
Pseudoscarus pulchellus 423
Scarus 496
bifasciatus, Amphiprion 6
Platyglossus 285
bifer, Julis 367, 368
Novaculichthys 367
bilineatus, Pomacentrus 90
bilunulatus, Cossyphus 207
Labrus 201, 207
Lepidaplois 207, 209
bimaculatus, Cheilinus 344
Gliphidodon 18
Halichoeres 250
biniar, Glyphisodon 125
binotopsis, Choerojulis 285
Halichoeres 284, 285
Julis (Halichoeres) 285
Platyglossus 285

Page

biocellatus, Abudefduf 166
Glyphidodon antjerius 166
Glyphisodon 166
Pomacentrus 90
bitaeniatus, Chromis 56
bleekeri, Abudefduf 165
Halichoeres 289, 294
Platyglossus 289
blochii, Callyodon 462
Cheilinus 245
Crenilabrus 343
Julis 327
Scarus 462
Thalliurus 362
boholensis, Amphiprion 7
bonang, Abudefduf 154
Glyphidodon 154
Glyphisodon 154
Paraglyphidodon 154
bottae, Scarichthys 375
Scarus 375
bowersi, Callyodon 399, 400, 403, 405, 407
brachialis, Pomacentrus 80
Brachypomacentrus 65
breviceps, Amblypomacentrus 114
Glyphidodon 114
Glyphisodon 65, 114
Pomacentrus 114, 116
brevifilis, Pseudoscarus 493, 494
brevipinnis, Heptadecanthus 27
brownriggii, Abudefduf 166
Chaetodon 166
Glyphidodon 166, 179
Glyphisodon 133, 166
burroughi, Pomacentrus 77, 80, 90, 96
caelestinus, Glyphidodon 128
caerulea, Mormyra major 381
Novacula 381
caeruleomaculata, Duymaeria 216
caeruleopunctatus, Anampses 228
caeruleo-punctatus, Anampses 228
caeruleopunctatus, Scarichthys 374, 377
caeruleovittatus, Halichores 255
Julis 255
caeruleus, Chromis 61
Gomphosus 331
Heliases 30, 61
Heliastes 61
Pomacentrus 70
caesio, Abudefduf 170
Calliodon 381
lineatus 381, 385
Callyodon 381
abacurus 399
albipunctatus 397
balinensis 410, 414, 457, 474, 484
bataviensis 410, 414
bicolor 496, 497
blochii 462
bowersi 399, 400, 403, 405, 407
capistratoides 410
caudofasciatus 446
chlorolepis 374
cyanogrammus 399, 407, 413
dimidiatus 425, 448
dubius 457, 473, 484
dussumieri 449

Callyodon—Continued. Page
elerae 453, 454
erythrodon 385, 386, 474, 484
fasciatus 429
forsteri 410
frenatus 436
fumifrons 425, 429
genistriatus 380
ghobban 459
gilberti 414
guttatus 493, 494
hadji 462, 463
harid 420
hypselopterus 484
hypselosoma 380
janthochir 444
kelloggi 434, 436
lacerta 473, 484
latifasciatus 460, 462
lazulinus 453, 454, 457
lineolabiatus 457
macrorhinus 469, 471
maoricus 488, 493
margaritus 397, 496
microcheilos 417
microrhinos 418
molluccensis 377, 380
muricatus 397, 398, 474, 484, 495
mutabilis 414
nigra 493
nuchipunctatus 487
oedema 385
ogos 407
oktodon 410, 414
oviceps 452
paluca 471
pectoralis 453
philippinus 462, 463, 469
prasiognathus 488, 493, 495
pronus 410, 414
pulchellus 423
purpureus 398
pyrrhurus 399, 405, 407
quoyi 407
rivulatus 430
rostratus 399
ruberrimus 469, 471
rubroviolaceus 469
sandwicensis 378, 379
sordidus 386, 387, 398
spinidens 380
tricolor 460
ultramarinus 418, 420
upolensis 469, 471
vaigiensis 380
vermiculatus 472
viridescens 378
viridibusius 459
zonularis 446, 449
Callyodontidae 372
Calotomus 376
cyclurus 378, 379
irradians 380, 381
moluccensis 378, 379
sandvicensis 378
sandwicensis 378, 381

Calotomus—Continued. Page
vaigiensis 377
xenodon 376
calus, Scarus 469
candovittatus, Labrichthys 219
capistratoides, Callyodon 410
Pseudoscarus 410
Scarus 410
cartieri, Dischistodus 104, 105
castaneus Chaerojulis 220
casturi Stethojulis 244
catunco Pomacentrus 90
caudofasciatus, Callyodon 446
Pseudoscarus 446
cautus, Onychognathus 30
celebica, Novacula 372
celebicus, Hemipteronotus 372
Julis (Julis) 322
Pseudoscarus 399
Scarus 399
centriquadrus, Halichoeres 253
Hemitautoga 253
Labrus 250, 253
Platyglossus (Hemitautoga) 253
Centrochromis 122
cepedianus, Gomphosus 334
ceramensis, Cheilinus 344, 345
ceylonicus, Julis 255
Platyglossus 255
chabrolii, Crenilabrus 208
chadri, Scarus 382
Chaerojulis 250
castaneus 220
Chaetodon abu-dafar 23
Chaetodon abudafur hanni 128, 129
araneus 23
arcuatus 13, 22
aruanus 13, 21
bengalensis 128
biaculeatus 4
brownriggii 166
chrysurus 89
coelestinus 130
curacao 138
lividus 65, 116
marginatus 121, 122
pavo 65, 68
rotundus 125
saxatilis 121, 124
sordidus 121, 132
tyrwhitti 125
Cheilinas 343
Cheilinoides 338
cyanopleura 338, 339
Cheilinus 343
abudjubbe 348
arenatus 343
bimaculatus 344
blochii 245
ceramensis 344, 345
chlorurus 348, 362
cingulatus 357, 358
coccineus 355
commersonii 354
decaconthus 363
diagramma 354

Page

Cheilinus—Continued.
diagrammus 354, 363
fasciatus 350
festivus 353
guttatus 363
hexagonatus 357, 358
hexataenia 341
macrocheilus 247
maculosus 348
mertensii 353
nebulosus 348
nigropinnatus 350
oxycephalus 346, 359
oxyrhynchus 363
polygramma 348
pulchellus 348
punctatus 362
punctulatus 362
quinquecinctus 350
radiatus 355
rivulatus 348
rostratus 358
sanguineus 362
sinuosus 348
tetrazona 348
trilobatus 343, 347, 348
undulatus 343, 352, 363, 365
unifasciatus 357, 358
zonurus 357
Cheilio 335
auratus 335, 336
bicolor 336
cyanochloris 336
forskalii 336
fuscus 336
hemichrysos 336
inermis 335
microstoma 336
ramosus 336
udanad 336
viridis 336
Cheilolabrus 244
magnilabris 244, 247
Cheiloprion 64
labiatus 64
Chetedon aruanus 21
Chilinus 343
ceramensis 344
chlorurus 362
fasciatus 350
godeffroyi 353, 365
punctulatus 362
radiatus 355
trilobatus 347
undulatus 352
Chilio 335
auratus 336
inermis 336
Chlorichthys 315
chlorodon, Scarus 398
chlorodus, Labrus 194
chlorolepis, Callyodon 374
chloropterus, Halichoeres 294
Labrus 294
Platyglossus 294
chlorostigma, Anampses 229
Chlorurus 382

Page

chlorurus, Cheilinus 348, 362
Chilinus 362
Sparus 362
Choerodon 191, 192, 200
anchorago 193
azurio 192
jordani 200
margaritiferus 197
melanostigma 199
oligacanthus 200
schoenleinii 198
zamboangae 196
Choerojulis bicolor 282
binotopsis 285
dussumieri 280
hartzfeldi 291
miniata 270
poecila 273
pyrrhogramma 287
scapularis 255
schwarzi 279
trimaculata 258
Choerops 191
anchorago 193
auritum 374
azurio 192
graphicus 194
japonicus 192
leucozona 194
macrodon 193
macrodontus 194
maeander 194
meander 194
meleagris 191, 194
oligacanthus 200
ommopterus 198
palawanensis 200
schoenleinii 198
unimaculatus 198, 199
zamboangae 196
Choirodon 191
anchorago 193
azurio 192
choirodon, Labrus 194
Choirodon oligacanthus 200
Chromis 14, 29, 31
amboinensis 35
analis 60, 138, 142
atripes 43
azurelineatus 57
bitaeniatus 56
caeruleus 61
cinerascens 54, 55
desmostigma 51
dimidiatus 45, 48
elerae 52
insulindicus 55
iomelas 45, 47
lepidolepis 53
lepidurus 61
lepisurus 61
leucurus 45, 47
lineatus 50
lividus 30
notatus 38
opercularis 42, 47
philippinus 31, 35

Chromis—Continued. Page
reticulatus 40
retrofasciatus 53
scotochilopterus 38, 39, 40
chromis, Sparus 29
Chromis ternatensis 31
weberi 41, 48
chrysargyrus, Amphiprion 7
chrysarurus Amphiprion clarkii 7
Chrysiptera 122
gaimardi 174
modesta 145, 147
unimaculatus 145, 147
chrysopocitus, Pomacentrus 109
chrysopoecilus, Dischistodus 109
Pomacentrus 109, 110
Pomacentrus (Dischistodus) 109
chrysopoma, Pseudoscarus 462
chrysopomus, Scarus 462
chrysopterus Amphiprion 7
chrysotaenia, Julis (Halichoeres) 269
chrysurus, Chaetodon 89
Pomacentrus 89
cinctus, Heliastes 44
cinerascens, Chromis 54, 55
Heliases 54
Heliastes 54
cingulatum, Glyphidodon 149
cingulatus, Cheilinus 357, 358
Glyphidodon 149, 179
cingulum, Coris 303
Julis 303
Labrus 303, 304
Cirrhilabrus 338
cyanopleura 339
lyukyuensis 339, 340
temminckii 338
clarckii, Amphiprion 7
clarki, Abudefduf 136, 137
Amphiprion 7
clarkii, Anthias 7
Prochilus 7
clepsydralis, Julis 329
coccineus, Cheilinus 355
coelestinus, Abudefduf 130
Abudefduf, coelestinus 130
Chaetodon 130
Glyphidodon 125, 130
(Glyphidodon) 130
Glyphisodon 130
coerulea, Coryphaena 381
coeruleomaculatus 229
coeruleopunctatus, Anampses 229
Scarichthys 375, 378, 379, 380
Scarus (Callyodon) 375
coerulo-punctatus, Scarus 375
coeruleovittata, Guntheria 255
coeruleovittatus, Halichoeres 250
coeruleus, Heliases 61
commersonii, Cheilinus 354
coracinus, Abudefduf 160, 161
Coris 302
angulata 303, 304
angulatus 303
annulata 313
aygula 302, 303
batuensis 306

Coris—Continued. Page
cingulum 303
cyanea 303
(Hologymnus) doliata 313
elongata 314
flavovittata 310
formosa 312
(Labrus) formosa 311
formosus 312
gaimard 311
gaimardi 311
coris, Julis 303
Coris longipes 314
multicolor 308
philippina 309
pulcherrima 312
semipartita 314
variegata 304
(Hemicoris) variegata 304
variegatus 310
venusta 307
corneyi, Abudefduf 160
Coryphaena coerulea 381
pentadactylus 370
Cossyphe 202
Cossyphodes 191
Cossyphus albotaeniatus 207
anchorago 193
anthioides 201
atrolumbus 206
bilunulatus 207
cyanostolus 198
diana 204
dimidiatus 221, 222
echiis 341
echis 341
macrurus 208
maldat 209
mesothorax 202
mesotyorax 202
octomaculatus 202
ommopterus 198
oxycephalus 201
perditio 206
schoenleinii 198
Crassilabrus 343
Crenilabrus aurigaria 215
blochii 343
chabrolii 208
croceus 208
elegans 203
leucogona 194
oligacanthus 200
spilogaster 216
croceus, Crenilabrus 208
croicensis, Scarus 381, 382
cruentatus, Julis 256
Scarus 385
Ctenoglyphidodon 185
Ctenolabrus aurigarius 216
flagellifer 215
flagellifera 216
rubellio 216
cucopleura, Glyphidodon 133
curacao, Abudefduf 138
Chaetodon 138
Glyphidodon 138

Page

curassao, Glyphisodon 138
cuvieri, Julis (Halichoeres) 294
cyanea, Coris 303
cyaneus, Abudefduf 168
Glyphidodontops 165
Glyphidodon 122, 168
cyanirostris, Xyrichthys 370
cyanochloris, Cheilio 336
cyanogaster, Thalassoma 326
cyanogrammus, Callyodon 399, 407, 413
cyanomas, Pomacentrus (Pomacentrus) 73
cyanomos, Pomacentrus 73, 74
cyanomus, Pomacentrus 73
cyanopleura, Cheilinoides 338, 339
Cirrhilabrus 339
Julis (Halichoeres) 300
cyanospilos, Pomacentrus 116
cyanospilus, Pomacentrus 116
cyanostigma, Pristotis 65
cyanostolus, Cossyphus 198
cyanotaenia, Labrichthys 219, 220
Thysanochilus 220
cyanotaenius, Labrichthys 220
cyanurus, Scarus 421
cyclurus, Calotomus 378, 379
cymatogrammus, Halichoeres 256
Cymolutes 368
lecluse 368
lqclusii 368
praetextatus 368
cypho, Scarus 414
daedalma, Halichoeres 273
Dascillus 13
Dascyllus 13, 20
albisella 14, 17
aruanus 21, 22
marginatus 17
melanurus 20
niger 14
nigripinnis 18
polyacanthus 27
reticulatus 18
trimaculatus 14, 18
unicolor 14
xanthosoma 18
xanthurus 71
Daya 120
jerdoni 120, 121
jerdoni var. fusca 121
decaconthus, Cheilinus 363
declivifrons, Euchistodus 122
decussatus, Sparus 253
delurus, Pomacentrus 90, 96
desmogenys, Halichoeres 276
desmostigma, Chromis 51
devisi, Pomacentrus 23
diacanthus, Holocentrus 68
diadematus, Anampses 230
diagramma, Cheilinus 354
diagrammus, Cheilinus 354, 363
Labrus 354
diana, Cossyphus 204
Labrus 204
Lepidaplois 204
picki, Abudefduf 147

Page

dickii, Abudefduf 53, 147
Glyphidodon 147
(Stegastes) 147
Glyphisodon 147
dieschismenacanthus Julis (Halichoeres) 279
dimidiata, Tautoga 247
dimidiatus, Callyodon 425, 448
Chromis 45, 48
Cossyphus 221, 222
Heliastes 45
Labroides 222
Pseudoscarus 425
Scarus 425
Diproctacanthus 221
xanthurus 233
Dischistodus 65
cartieri 104, 105
chrysopoecilus 109
fasciatus 111
notophthalmus 105, 107
prosopotaenia 104
trimaculatus 102
dispar, Glyphidodon 145
doleschalli, Platyglossus (Halichoeres) 279
doliata, Coris (Hologymnus) 313
doliatus, Julis 313
Labrus 313
dolii, Pomacentrus 121
dorsale, Thalassoma 317
dorsalis, Julis 317
Pomacentrus 89, 90, 96
dorsomaculatus, Pomacentrus 102
Dorychromis 60
dubius, Callyodon 457, 473, 484
Pseudoscarus 473
Scarus 473
duperrei, Julis 329
duperrey, Julis 329
Thalassoma 329
duperreyi, Julis 329
dussumieri, Callyodon 449
Choerojulis 280
Halichoeres 280
Julis 280
Platyglossus 280
Pseudoscarus 449
Scarus 449
Duymaeria 215
amboinensis 215, 216
aurigaria 216
caeruleomaculata 216
flagellifera 216, 219
guttata 218
japonica 216
spilogaster 216
Dygmaeria flagellifera 216
echiis, Cossyphus 341
echis, Cossyphus 341
elegans, Crenilabrus 203
Julis 256
elerae, Callyodon 453, 454
Chromis 52
elongata, Coris 314
elongatus, Pomacentrus 90
Elops 331

	Page
emamo, Pomacentrus	23
emarginatus, Pomacentrus	89
enneacanthus, Labrus	350
ensifer, Sargus	5
ephippium, Amphiprion	7
Lutjanus	6
Epibulus	211, 212
aureus	213
var. flava	213
insidiator	213
striatus	213
epigrammata, Premnas	5, 6
Erychthys	382
erythrodon, Callyodon	385, 386, 474, 484
Pseudoscarus	385
Scarus	385
erythrogenys, Scarus	488
Euchistodus declivifrons	122
Euhypsocara	201
Eupemis	335
Eupomacentrus	65
albofasciatus	117
ater	81
(Eupomacentrus) lividus	118
lividus	116
Euschistodus	122
evanidus, Pseudocheilinus	341, 342
eximius, Halichoeres	253
exornatus, Julis	280
eydouxii, Julis	310
fasciata, Tautoga	245
fasciatus, Callyodon	429
Cheilinus	350
Chilinus	350
Dischistodus	111
Glyphidodon antjerius	167
Hemigymnus	245, 246
Hologymnosus	313
Labrus	245, 315
Mullus	244, 245
Pomacentrus	65, 111
Scarus	429
Sparus	125, 350
festivus, Cheilinus	353
Scarus	398
filholi, Stethojulis	237
Fissilabrus	221
flagellifera, Ctenolabrus	215, 216
Duymaeria	216, 219
flava, Epibulus aureus	213
flavoguttatus, var. Pseudoscarus troschelis	399
flavomarginatus, Pseudoscarus	399
flavovittata, Coris	310
flavovittatus, Julis	310
florulentus, Glyphidodon	149
flos-corallis, Platyglossus	261, 262
formosa, Coris	312
Coris (Labrus)	311
Julis	311
formosus, Coris	312
Julis	311
(Halichoeres)	311
Labrus	311, 312
forskalii, Cheilio	336
forsteri, Callyodon	410
Pseudoscarus	399, 407, 410
Scarus	410
Sparus	209
fraenatus, Pseudoscarus	436
frenatus, Amphiprion	9
Callyodon	436
Heliases	61
Pseudoscarus	436
Scarus	418, 436
fuliginosus, Hemigymnus	245
Labrus	245
fulvoventris, Stethojulis	235
fumifrons, Callyodon	425, 429
Furcaria	30
puncta	30
furcatus, Pomacentrus	68
fusca, Daya jerdoni var	121
fuscus, Cheilio	336
Gomphosus	332
Pristotis	90
Thalassoma	188
fusiformis, Labrus	335, 336
gaimard, Coris	311
Julis	311
gaimardi, Chrysiptera	174
Coris	311
Julis	311
gallus, Scarus	322
geant, Glyphisodon	133
genistriatus, Callyodon	380
geoffroy, Macropharyngodon	299, 300
geoffroyi, Julis	299
Macropharyngodon	299
geoffroyii, Platyglossus	300
geographicus, Anampses	224, 227
ghobban, Callyodon	459
Scarus	382, 494
gibbifrons, Julis	303
gibbosus, Scarus	495
gibbus, Scarus	383, 435
gilberti, Callyodon	414
Scarus	410
girardi, Pseudojulis	188
glaucus, Abudefduf	80, 169, 180
Glyphisodon	169
Gliphidodon bicolor	45
bimaculatus	18
Gliphysodon	121
Glyphidodon	122
affinis	128
albocinctus	179
albofasciatus	178
(Amblyglyphidodon) aureus	142
leucogaster	171
trifasciatus	138
amboinensis	73
anabatoides	61, 183
anjerius	166
antjerius	166
var. biocellatus	166
var. fasciatus	167
var. unimaculatus	167
assimilis	174
aureus	142
azureus	168
bankieri	181
behnii	160
bengalensis	128
bonang	154
breviceps	114

Glyphidodon—Continued. Page
brownriggii 166, 179
var. xanthozona 177
caelestinus 128
cingulatum 149
cingulatus 149, 179
coelestinus 125, 130
cucopleura 133
curacao 138
dickii 147
dispar 145
florulentus 149
(Glyphidodon) bengalensis 128
coelestinus 130
septemfasciatus 135
sordidus 133
(Hemiglyphidodon) plagiometopon 185
hemimelas 167
lacrymatus 150, 151
leucogaster 145, 171
leucopleura 133
leucozona 149, 179
melas 161
modestus 169
mutabilis 154
nigrifrons 138
nivosus 151
notatus 136
oxyodon 164
pallidus 170
plagiometopon 185
rahti 125
rudis 122
saxatilis 124, 128
septemfasciatus 135
sordidus 133
(Stegastes) dickii 147
lacrymatus 151
taeniuruptus 178
trifasciatus 138
unifasciatus 147
unimaculatus 145
uniocellatus 173
xanthonotus 159
xanthozona 178
xanthurus 155
zonatus 179
Glyphidodontops 122
albofasciatus 178
antjerius 166
cyaneus 165
modesta 170
unimaculatus 145, 171
uniocellatus 174
zonatus 179
Glyphisodon 121
albofasciatus 178
amabilis 177
amboinensis 73
anabatoides 183
andjerinus 166
angulatus 54
antjerius 166
ater 161
aureus 122, 142
azureus 122, 168
balinensis 166

Glyphisodon—Continued. Page
bandanensis 61
bankieri 181
behnii 160
bengalensis 128
biniar 125
biocellatus 166
bonang 154
breviceps 65, 114
brownriggii 133, 166
coelestinus 130
curassao 138
cyaneus 122, 168
dickii 147
geant 133
glaucus 169
javanicus 55
lacrymatus 149, 151
leucogaster 138, 142, 171
leucozona 149
melas 161
moucharra 121
nemurus 181, 182
nigrifrons 138
nivosus 151
oxyodon 164
phaiosoma 170
plagiometopon 185
punctulatus 166
quadrifasciatus 125
rahti 125
rossii 167
saxatilis 124
septemfasciatus 135
sordidus 133
(Stegastes) leucozona 149
trifasciatus 138
tyrwhitti 125
unimaculatus 145
uniocellatus 173
vaigiensis 125
violaceus 161
waigiensis 125
xanthonotus 159
xanthozona 178
xanthurus 155
zonatus 179
Glyphodon albocinctus 179
geoffroy, Julis 299
godeffroyi, Chilinus 353, 365
Pseudoscarus 444
goldiei, Pseudoscarus 386
Gomphosis 331
Gomphosus 331
caeruleus 331
cepedianus 334
fuscus 332
melanotus 332
ornatus 334
pacificus 334
pectoralis 332
sandvicensis 334
tricolor 331, 333
undulatus 332, 333
varius 332
viridis 334
grammorhynchus, Pomacentrus 97

Page

granatinus, Julis 273
graphicus, Choerops 194
guacamaia, Scarus 382
guntheri, Homalogrystes 27
Julis 316
Thalassoma 316
Guntheria 250
coeruleovittata 255
trimaculata 258
guttata, Duymaeria 218
guttatus, Callyodon 493, 494
Cheilinus 363
Halichoeres 292
Labrus 250, 292
Platyglossus 292
Scarus 493, 494
guttulatus, Platyglossus 293
gymnocephalus, Halichoeres 296
Labrus 296
Platyglossus 296
gymnognathus, Pseudoscarus 386
Scarus 400
Gymnopropoma 201
hadji, Callyodon 462, 463
Halichoeres 250
amboinensis 288, 289
annulatus 273, 275
argus 292
bicolor 282
bimaculatus 250
binotopsis 284, 285
bleekeri 289, 294
centriquadrus 253
chloropterus 294
coeruleovittatus 250
cymatogrammus 256
daedalma 273
desmogenys 276
dussumieri 280
eximius 253
guttatus 292
gymnocephalus 296
hartzfeldii 291
heteropterus 302
hoevenii 268
hyrtlii 285
iris 316
kallochroma 261
leparensis 283, 285, 293, 294
leucostigma 299
leucurus 260
margaritaceus 271
marginatus 264, 265
melanochir 264
melanurus 262
miniatus 270
modestus 296
multicolor 308
nebulosus 273, 275, 276
nigrescens 280
nigropunctatus 301
notopsis 267
opercularis 272
papilionaceus 278
podostigma 297
poecila 273
poecilopterus 286, 287

Page

Halichoeres—Continued.
poecilus 273
prosopeion 290
pseudominiatus 271
purpurescens 260
pyrrogrammus 286
reichei 272, 273, 275
richmondi 263
scapularis 255
schwarzi 278
sexfasciatus 245
solorensis 278
tenuispinis 288
trimaculatus 258
variegatus 302, 304
vrolickii 266
Halichores caeruleo-vittatus 255
Halychoeres 250
hanni, Chaetodon abudafur 128, 129
Haplochromis 61
hardvickii, Julis 322
hardwicke, Sparus 317, 318
Thalassoma 317
harid, Callyodon 420
Pseudoscarus 420
(Scarus) 421
Scarus 420
harid, Scarus (Pseudoscarus) 421
harlofii, Julis (Halichoeres) 273
hartzfeldi, Choerojulis 291
Julis (Halichoeres) 291
hartzfeldii, Halichoeres 291
Platyglossus 291
hassek, Labrus 336
hebardi, Pomacentrus 77, 80
Heliases 29
amboinensis 35
analis 60
caeruleus 30, 61
cinerascens 54
coeruleus 61
frenatus 61
insolatus 29, 30
lepisurus 61
macrochir 60
reticulatus 18
ternatensis 31
Heliastes 30
analis 60
axillaris 44
caeruleus 61
cinctus 44
cinerascens 54
dimidiatus 45
lepidurus 61
opercularis 47
ternatensis 31
hemichrysos, Cheilio 336
Hemicoris 302
batuensis 306
remedius 307
variegatus 304
hemicyaneus, Abudefduf 165
Hemiglyphidodon 122, 185
plagiometopon 185
Hemigymnus 244
fasciatus 245, 246

Page

Hemigymnus—Continued.
fuliginosus 245
leucomos 245
melanopterus 247
melapterus 247
sexfasciatus 245
hemimelas, Glyphidodon 167
Hemipteronotus 370
celebicus 372
pentadactylus 370
quinque-maculatus 370
umbrilatus 370
Hemistoma 382
reticulatus 382
Hemitautoga 250
centriquadrus 253
Hemiulus 250
Heptadecacanthus 27
Heptadecanthus 27
brevipinnis 27
longicaudis 27
maculosus 27
heteropterus, Halichoeres 302
hexagonatus, Cheilinus 357, 358
hexataenia, Cheilinus 341
Psuedocheilinus 341
hexatenia Pseudocheilinus 341
Hinalea 231
hirsutus, Labrus 208, 209
Lepidaplois 208
hoevenii, Julis (Halichoeres) 268
Halichoeres 268
Platyglossus 268
hogoleuensis, Pomacentrus 77
Holacanthus biaculeatus 4
Holocentrus diacanthus 68
nigricans 118
sonnerat 4
Hologymnos 313
Hologymnosus 313
fasciatus 313
oxyrhynchos 314
semidiscus 313
Homalogrystes 27
guntheri 27
Hoplochromis 30
hortulanus, Julis 253
Labrus 253
Platyglossus 253
hypselopterus, Callyodon 484
Pseudoscarus 484
Scarus 484
hypselosoma, Callyodon 380
Hypsigenys 191
hyrtli, Platyglossus 285
hyrtlii, Julis (Halichoeres) 285
Halichoeres 285
Platyglossus 285
Ichtycollus 250
Icthycallus 250
imbricatus, Stegastes 122
inermis, Cheilio 335
Chilio 336
Labrus 335
insidiator, Epibulus 213
Sparus 212, 213
insolatus, Heliases 29, 30

Page

insulindicus, Chromis 55
intermedia, Pomacentrus fasciatus 111
intermedius, Amphiprion 6
interorbitalis, Pomacentrus 104
interrupta, Stethojulis 240
interruptus, Julis (Halichoeres) 240
Stethojulis 240
iomelas, Chromis 45, 47
Iridio 250
iris, Halichoeres 316
irradians, Calotomus 380, 381
ismailius, Pseudoscarus 450
janseni, Julis 324
Thalassoma 324
jansenii, Julis 324
Thalassoma 324
janthochir, Callyodon 444
Pseudoscarus 444
Scarus 444
jantochir, Pseudoscarus 444
japonica, Duymaeria 216
japonicus, Amphiprion 7
Amphiprion, clarki 7
Choerops 192
Labrus 192
javanicus, Glyphisodon 55
jenkinsi, Scarus 410
jerdoni, Daya 120, 121
Pomacentrus 120
jordani, Abudefduf 27
Choerodon 200
julioides Novacula 366
Julis 302
amblycephalus 330
aneitense 327
annularis 250, 265
annulatus 313
argus 292
axillaris 231, 234
aygula 303
ballieui 331
balteatus 241
beraber 247
bifer 367, 368
blochii 327
caeruleovittatus 255
ceylonicus 255
cingulum 303
clepsydralis 329
coris 303
cruentatus 256
doliatus 313
dorsalis 317
duperrei 329
duperrey 329
duperreyi 329
dussumieri 280
elegans 256
exornatus 280
eydouxii 310
flavovittatus 310
formosa 311
formosus 311
gaimard 311
gaimardi 311
geoffroy 299
geoffroyi 299

Julis—Continued.	Page
gibbifrons	303
granatinus	273
guntheri	316
(Halichoeres) amboinensis	288
bandanensis	235
batuensis	306
binotopsis	285
chrysotaenia	269
cuvieri	294
cyanopleura	300
dieschismenacanthus	279
formosus	311
harlofii	273
hartzfeldi	291
hoevenii	268
hyrtlii	285
interruptus	240
kallochroma	261
kallopisos	260
kalosoma	238
leporensis	283
melanurus	262
miniatus	270
modestus	296
mola	280
notophthalmus	280
phaiopus	267
phaiotaenia	256
phekadopleura	237
podostigma	297
polyophthalmus	293
prosopeion	290
pseudominiatus	271
reichei	275
renardi	242
schroderi	304
schwarzii	278
solorensis	278
spilurus	258
temminckii	260
vrolickii	266
hardvickii	322
hortulanus	253
janseni	324
jansenii	324
(Julis), amblycephalus	330
celibicus	322
kuelknel	369
melanochir	328
oxyrhynchos	314
quadricolor	316
schwanefeldi	320
urostigma	317
julis, Labrus	302
Julis leschenaulti	256
leucostictus	237
lineolatus	302
lunaris	321
lutescens	326
maculata	322
margaritaceus	271
margaritophorus	282
marginatus	265
melanochir	328
meleagris	300
meniscus	322

Julis—Continued.	Page
mertensii	322
miniatus	250
mola	282, 285
nebulosus	273
notopsis	267
obscura	331
papilionaceus	278
perlatus	293
poecila	273
poecilopterus	250, 286
porphyrocephala	321, 322
praetextata	368
prostigma	317
pulcherrima	312
punctatus	326
purpurea	326
pyrrhogramma	287
rosea	314
ruppelii	303
scapularis	255
schwanefeldi	320
schwanefeldii	320
sebanus	244
semicinctus	250
semi-decorata	294
semifasciatus	317
semipunctatus	250, 303
spilurus	285
strigiventer	231, 232
taenianotus	366
thyrsites	287
trimaculata	258
trimaculatus	366
truncatus	322, 323
umbrostigma	325
variegatus	304
verticalis	331
Stethojulis	238
kallochroma, Julis (Halichoeres)	261
Halichoeres	261
Platyglossus	261
kallopisos, Julis (Halichoeres)	260
kallosoma, Novacula	367
Novaculichthys	367
Kallosomus, Novaculichthys	367
kalosoma, Julis (Halichoeres)	238
katunko, Pomacentrus	90
kelloggi, Callyodon	434, 436
knerii, Pseudoscarus	474
kuelknel, Julis	369
kumkum, Pomacentrus	107, 117
labiatus, Cheiloprion	64
Pomacentrus	64
labiosus, Pseudoscarus	410
Labrastrum	215
Labrichthys	219
australis	220
candovittatus	219
cyanotaenia	219, 220
cyanotaenius	220
rubiginosa	219
rubiginosus	188
Labrichtys bicolor	247
Labridae	188
Labroides	221
bicolor	224

Page
Labroides—Continued.
dimidiatus 222
latovittatus 222
paradiseus 221, 222
xanthurus 221, 223
Labrus albovittatus 241
annulatus 313
arago 366
argus 292
aureomaculatus 303
axillaris 201
bicolor 282
bilunulatus 201, 207
centriquadrus 250, 253
chlorodus 194
chloropterus 294
choirodon 194
cingulum 303, 304
diana 204
digrammus 354
doliatus 313
enneacanthus 350
fasciatus 245, 315
formosus 311, 312
fuliginosus 245
fusiformis 335, 336
guttatus 250, 292
gymnocephalus 296
hassek 336
hirsutus 208, 209
hortulanus 253
inermis 335
japonicus 192
julis 303
latovittatus 222
leucurus 260
lunaris 321, 326
lunulatus 343
macrodontus 191, 193
macrogaster 128
macrolepidotus 365
macrourus 208
malapteronotus 245
melapterus 247
mesothorax 202
nasutus 332
nigrescens 280
perditio 206
pulcherrimus 317
purpurescens 260
radiatus 250
rubrolineatus 208
scapularis 247
semidiscus 313
sexfasciatus 129
spilonotus 208
taeniourus 365
trilineatus 241, 243
zeylanicus 322
lacerta, Callyodon 473, 484
Pseudoscarus 473
Scarus 473, 474
lacrymatus, Abudefduf 151
Glyphidodon 150, 151
(Stegastes) 151
Glyphisodon 149, 151
laevibus, Platiglossus squamulis 250
latifasciatus, Callyodon 460, 462
latovittatus, Labroides 222
Labrus 222
latus, Scarus 421
lazulinus, Callyodon 453, 454, 457
lecluse, Cymolutes 368
Xyrichthys 368
leclusii, Cymolutes 368
lemminckii, Cirrhilabrus 338
leparensis, Halichoeres 283, 285, 293, 294
Julis (Halichoeres) 283
Platyglossus 283
Lepidaplois 201, 202
albotaeniatus 207
bilunulatus 207, 209
diana 204
hirsutus 208
loxozonus 209
macrurus 208
mesothorax 202, 203
mirabilis 202
perditio 206
richardsoni 207, 208
strophodes 207, 208
trotteri 209, 210
Lepidochromis 58
lepidogenys, Pomacentrus 98
lepidolepis, Chromis 58
Lepidozygus 25
tapeinosoma 25, 26
lepidurus, Chromis 61
Heliastes 61
lepisurus, Chromis 61
Heliases 61
Leptojulis 300
pardalis 301
Leptoscarus 376
moluccensis 377
sandwicensis 377, 378
vaigiensis 380
viridescens 378
leschenaulti, Julis 256
leucodesmus, Premnas 5
leucogaster, Abudefduf 138, 142, 171
Glyphidodon 145, 171
(Amblyglyphidodon) 171
Glyphisodon 138, 142, 171
leucomos, Hemigymnus 245
Tautoga 245
leucopleura, Glyphidodon 133
leucosphyrus, Pomacentrus 73, 74, 75
leucostictus, Julis 237
leucostigma, Halichoeres 299
leucozona, Abudefduf 149, 154, 180
Choerops 194
Crenilabrus 194
Glyphidodon 149, 179
Glyphisodon 149
(Stegastes) 149
leucozonus, Abudefduf 149
leucurus, Chromis 45, 47
Halichoeres 260
Labrus 260
Lienardella 202
limbatus, Pseudoscarus 488
Scarus 488

	Page
lineatus, Calliodon	381, 385
Chromis	50
lineolabiatus, Callyodon	457
lineolatus, Anampses	226
Julis	302
littoralis, Pomacentrus	65, 76, 90, 110
Pomacentrus (Pseudopomacentrus)	77
lividus, Chaetodon	65, 116
Chromis	30
Eupomacentrus	116
(Eupomacentrus)	118
Pomacentrus	77, 105, 116
Scarus	474
longicauda, Petronason	421
longicaudis, Heptadecanthus	27
longiceps, Pseudoscarus	421
Scarus	421
longipes, Coris	314
longirostris, Acarauna	331
Loro	382
loxozonus, Lepidaplois	209
lunare, Thalassoma	321
lunaris, Julis	321
Labrus	321, 326
Thalassoma	322, 327
lunulatus, Labrus	343
upus, Scarus	452
utescens, Julis	326
Thalassoma	326
Lutjanos, trifasciatus	4
Lutjanus, aruanus	22
ephippium	6
percula	6, 11
lyukyuensis, Cirrhilabrus	339, 340
macrocheilus, Cheilinus	247
macrochir, Heliases	60
Macrochoerodon	200
macrodon, Choerops	193
macrodontus	194
Labrus	191, 193
macrogaster, Labrus	128
macrolepidota, Novacula	366
macrolepidotus, Labrus	365
Novaculichthys	365
Xyrichthys	365
Macropharyngodon	299
geoffroy	299, 300
goeffroyi	299
macrorhinus, Callyodon	469, 471
macrostoma, Prochilus	10
macrourus, Labrus	208
macrurus, Cossyphus	208
Lepidaplois	208
maculata, Julis	322
maculosus, Cheilinus	348
Heptadecanthus	27
Pseudoscarus	493
Scarus	493, 494
maeander, Choerops	194
magnilabrus, Cheilolabrus	244, 247
malapteronotus, Labrus	245
maldat, Cossyphus	209
maoricus, Callyodon	488, 493
Marcropharyngodon aquiloio	300
margaritaceus, Halichoeres	271
Julis	271
margaritiferus, Choerodon	197
margaritophorus, Julis	282
margaritus, Callyodon	397, 496
Pseudoscarus	397
marginatus, Chaetodon	121, 122
Dascyllus	17
Halichoeres	264, 265
Julis	265
Platyglossus	265
Pomacentrus	17, 19
mastax, Pseudoscarus	421
Pseudoscarus harid var.	421
Scarus	421
meaco, Sparus	245
meander, Choerops	194
megalops, Pomacentrus	81
melanocarpus, Abudefduf	182
melanochir, Halichoeres	264
Julis	328
(Julis)	328
Thalassoma	317, 318, 320, 328
melanopselion, Abudefduf	185, 187
melanopterus, Hemigymnus	247
Pomacentrus	80
(Pseudopomacentrus)	80
melanopus, Prochilus	10
melanostigma, Choerodon	199
melanotus, Gomphosus	332
Pomacentrus	107
melanurum, Tetradrachmum	20
melanurus, Amphiprion	12
Dascyllus	20
Halichoeres	262
Julis (Halichoeres)	262
Platyglossus	262
Tetradrachmum	20
melapterus, Hemigymnus	247
Labrus	247
Tautoga	247
melas, Abudefduf	161
Glyphidodon	161
Glyphisodon	161
Paraghlyphidodon	161
meleagrides, Anampses	227
meleagris, Anampses	227
Choerops	191, 194
Julis	300
meniscus, Julis	322
mentalis, Scarus	398
mertensii, Cheilinus	353
Julis	322
Tautoga	245
mesothorax, Cossyphus	202
Labrus	202
Lepidaplois	202, 203
mesotyorax, Cossyphus	202
microcheilos, Callyodon	417
Pseudoscarus	417
Scarus	417
micrognathos, Scarus	430
microlepidotus, Xyrichthys	368
microlepis, Novacula	369
Micropodus	335
microrhinos, Callyodon	418
Pseudoscarus	418
Scarus	418

Page

microrhinus, Pseudoscarus 418
Scarus 435, 469
microstoma, Cheilio 336
milii, Sparus 7
miniata, Choerojulis 270
Halichoeres 270
Julis 250
(Halichoeres) 270
Platyglossus 270
mirabilis, Lepidaplois 202
modesta, Chrysiptera 145, 147
Glyphidodontops 170
modestus, Abudefduf 170
Glyphidodon 169
Halichoeres 296
Julis (Halichoeres) 296
Platyglossus 296
mola, Julis 282, 285
Julis (Halichoeres) 280
moluccanus, Odax 210
Pseudodax 210
moluccensis, Callyodon 377, 380
Calotomus 378, 379
Leptoscarus 377
Odax 210
Pomacentrus 77, 80
(Pseudopomacentrus) 77
Pseudodax 210
montrouzieri, Pomacentrus 90, 107
mordax, Scarus 203
moresbyensis, Pseudoscarus 457
Mormyra 381
major caerulea 381
moucharra, Glyphisodon 121
Mullus fasciatus 244, 245
multicolor, Coris 308
Halichoeres 308
muricatus, Callyodon 397, 398, 474, 484, 495
Pseudoscarus 495
Scarus 495
murrayensis, Pseudojulis 256
mutabilis, Callyodon 414
Glyphidodon 154
Pseudoscarus 414
mylii, Amphiprion 7
naevius, Scarus 373, 374
nasutus, Labrus 332
Neanis 302
neanis, Thalassoma 327
nebulosus, Cheilinus 348
Halichoeres 273, 275, 276
Julis 273
Platyglossus 273, 275
nematopterus, Pomacentrus 114
nemurus, Glyphisodon 181, 182
niger, Dascyllus 14
Scarus 382, 488
nigra, Callyodon 493
nigrescens, Halichoeres 280
Labrus 280
nigricans, Holocentrus 118
Pomacentrus 77, 118
Scarus 398
Sparus 14
nigrifrons, Glyphidodon 138
Glyphisodon 138

Page

nigripinnis, Dascyllus 18
Pseudoscarus 421
nigromaculatus, Platyglossus 301
nigromanus, Pomacentrus 81, 82
nigropinnatus, Cheilinus 350
nigropunctatus, Halichoeres 301
nivosus, Glyphidodon 151
Glyphisodon 151
notatus, Abudefduf 136
Chromis 38
Glyphidodon 136
Pomacentrus 68
notophthalmus, Dischistodus 105, 107
Julis (Halichoeres) 280
Pomacentrus 107
notopsis, Halichoeres 267
Julis 267
Platyglossus 267
notostigmus, Pomacentrus 109
Novacula 381
caerulea 381
celebica 372
(Hemipteronotus) pentadactyla 370
julioides 366
kallosoma 367
macrolepidota 366
microlepis 369
pentadactylus 370
punctulata 370
sex-maculata 370
tessellata 370
xyrichthyoides 369
Novaculichthys 365
bifer 367
kallosoma 367
kallosomus 367
macrolepidotus 365
novaculoides Xyrichthys 369
nuchalis, Pomacentrus 14
nuchipunctatus, Callyodon 487
Pseudoscarus 487
Scarus 487
obscura, Julis 331
obscurus, Pomacentrus 117
obtusirostris, Pomacentrus 26
ocellaris, Amphiprion 12
ocellatus, Platyglossus 220
Octocynodon 250
octomaculatus, Cossyphus 202
octotaenia, Pseudocheilinus 341
Odax 382
moluccanus 210
moluccensis 210
odon 382
odon, Odax 382
oedema, Callyodon 385
ogos, Callyodon 407
oklodon, Callyodon 410, 414
oligacanthus, Choerops 200
Choirodon 200
Crenilabrus 200
ommopterus, Choerops 198
Cossyphus 198
Onychognathus 30
cautus 30
onyx, Pomacentrus 20

Page

opercularis, Chromis 42, 47
Halichoeres 272
Heliastes 47
Platyglossus 272
Ophthalmolepis 302
opisthostigma, Pomacentrus 90, 96
ornatus, Gomphosus 334
Thysanocheilus 219, 220
oviceps, Callyodon 452
Pseudoscarus 452
Scarus 452
ovoides, Pomacentrus 112
oxycephalus, Cheilinus 346, 359
Cossyphus 201
Paraglyphidodon 122
Oxycheilinus 343
oxyodon, Abudefduf 164
Glyphidodon 164
Glyphisodon 164
Paraglyphidodon 164
oxyrhynchos, Hologymnosus 314
Julis (Julis) 314
oxyrhynchus, Cheilinus 363
pacificus, Gomphosus 334
pagenstacheri, Platyglossus (Guntheria) 256
palawanensis, Choerops 200
pallidus, Glyphidodon 170
paluca, Callyodon 471
Scarus 469
papilionaceus, Halichoeres 278
Julis 278
papuensis, Pseudoscarus 462
paradiseus, Labroides 221, 222
Paraglyphidodon melas 161
Paraglyphidodon 122
behnii 160
bonang 154
oxycephalus 122
oxyodon 164
xanthonotus 159
xanthurus 155
Parajulis 250
Parapomacentrus 65
bankieri 182
parasema, Abudefduf 175, 177
pardalis, Leptojulis 301
Platyglossus 301
pavo, Chaetodon 65, 68
Pomacentrus 68, 70, 71
(Pomacentrus) 68
pavoninus, Pomacentrus 68
pectoralis, Callyodon 453
Gomphosus 332
Pseudoscarus 453
Scarus 453
Pellochromis 14
pentadactylus, Coryphaena 370
Hemipteronotus 370
Novacula 370
(Hemipteronotus) 370
pentazona, Pseudoscarus 414
pepo, Scarus 382
Perca polymna 6
percula, Amphiprion 11
Lutjanus 6, 11
Prochilus 11

Page

perditio, Cossyphus 206
Labrus 206
Lepidaplois 206
perlatus, Julis 293
perspicillatus, Pomacentrus 101, 104
Petronason 382
longicauda 421
phaiopus, Julis (Halichoeres) 267
phaiosoma, Glyphisodon 170
phaiotaenia, Julis (Halichoeres) 256
phecadopleura, Stethojulis 237
phekadopleura, Julis (Halichoeres) 237
Stethojulis 237
philippina, Coris 309
Wetmorella 211
philippinus, Abudefduf 138, 142
Callyodon 462, 463, 469
Chromis 31, 35
Pomacentrus 112, 113, 114
Pirene 13
plagiometopon, Glyphidodon 185
Glyphidodon (Hemiglyphidodon) 185
Glyphisodon 185
Hemiglyphidodon 185
Platiglossus 250
squamulis laevibus 250
platodoni, Pseudoscarus 386
Platyglossus 250
alternans 256
amboinensis 288
bicolor 282
bifasciatus 285
binotopsis 285
bleekeri 289
centriquadrus (Hemitautoga) 253
ceylonicus 255
chloropterus 294
(Halichoeres) doleschalli 279
dussumieri 280
flos-corallis 261, 262
goeffroyii 300
guttatus 292
guttulatus 293
gymnocephalus 296
hartzfeldii 291
hoevenii 268
hortulanus 253
hyrtelii 285
hyrtli 285
kallochroma 261
leparensis 283
marginatus 265
melanurus 262
miniatus 270
modestus 296
nebulosus 273, 275
nigromaculatus 301
notopsis 267
ocellatus 220
opercularis 272
pagenstacheri (Guntheria) 256
pardalis 301
podostigma 297
poecilopterus 286
poecilus 273
prosopeion 299

Platyglossus—Continued. Page
pseudogramma 285, 286
pseudominiatus 271
purpurascens 260
purpurescens 260
pyrrhogramma 287
reticulatus 283
scapularis 255
schwarzi 278
schwarzii 278
solorensis 278
tenuispinis 288
trimaculatus 258
ubayensis 266, 267
vrolicki 266
vrolickii 266
podostigma, Julis (Halichoeres) 297
poecila, Choerojulis 273
Halichoeres 273
Julis 273
poecilopterus, Halichoeres 286, 287
Julis 250, 286
Platyglossus 286
poecilus, Halichoeres 273
Platyglossus 273
polyacanthus, Acanthochromis 27
Dascyllus 27
Tetradrachmum 27
polygramma, Cheilinus 348
polylepis, Amphiprion 9
Prochilus 9, 10
polymna, Perca 6
polymnus, Amphiprion 6, 7
Anthias 6, 12
Prochilus 7
polynema, Pomacentrus 65
polyophthalmus, Julis (Halichoeres) 293
Pomacentrus 65, 181
albifasciatus 65
albofasciatus 104
alexanderae 81, 86
amboinensis 86
(Pseudopomacentrus) amboinensis 86
anabatoides 41, 43, 183
(Pseudopomacentrus) anabatoides 183
analis 81
aruanus 22
ater 81
azysron 181
(Pseudopomacentrus) azysron 181
bankanensis 90
beauforti 115
bilineatus 90
biocellatus 90
brachialis 80
breviceps 114, 116
burroughi 77, 80, 90, 96
caeruleus 70
catunco 90
chrysopocitus 109
chrysopoecilus 109, 110
(Dischistodus) chrysopoecilus 109
chrysurus 89
(Pomacentrus) cyanomos 73
cyanomos 73, 74
cyanomus 73

Pomacentrus—Continued. Page
cyanospilos 116
cyanospilus 116
delurus 90, 96
devisi 23
dolii 121
dorsalis 89, 90, 96
dorsomaculatus 102
elongatus 90
emamo 23
emarginatus 89
fasciatus 65, 111
var. intermedia 111
furcatus 68
grammorhynchus 97
hebardi 77, 80
hogoleuensis 77
interorbitalis 104
jerdoni 120
katunko 90
kumkum 107, 117
labiatus 64
lepidogenys 98
leucosphyrus 73, 74, 75
littoralis 65, 76, 90, 110
(Pseudopomacentrus) littoralis 77
lividus 77, 105, 116
marginatus 17, 90
megalops 81
melanopterus 80
(Pseudopomacentrus) melanopterus 80
melanotus 107
moluccensis 77, 80
(Pseudopomacentrus) moluccensis 77
montrouzieri 90, 107
nematopterus 114
nigricans 77, 118
nigromanus 81, 82
notatus 68
notophthalmus 107
notostigmus 109
nuchalis 14
obscurus 117
obtusirostris 26
onyx 20
opisthostigma 90, 96
ovoides 112
pavo 68, 70, 71
(Pomacentrus) pavo 68
pavoninus 68
perspicillatus 101, 104
philippinus 112, 113, 114
polynema 65
popei 77, 80
pristiger 109, 110
prosopotaenia 104, 118
prosopotaenioides 116
prosopotœnia 117
punctatus 116
punctolineatus 90
rathbuni 71
reidi 99
scolopseus 118
scolopsis 118
simsiang 90
sinsiang 90

Pomacentrus—Continued. Page
smithi 75
sordidus 132
stigma 100
subniger 118
suluensis 107
taeniometopon 90
taeniops 89, 118
taeniurus 72
(Pomacentrus) taeniurus 73
tapeinosoma 25
trifasciatus 23
trilineatus 89
(Pseudopomacentrus) trilineatus 89
trimaculatus 14, 101, 117, 118
tripunctatus 89
tropicus 90
unifasciatus 18
vanicolensis 89, 96
violescens 71, 81, 86
(Pomacentrus) violescens 71
vitianus 117
popei, Pomacentrus 77, 80
porphyrocephala, Julis 321, 322
praetextata, Julis 368
praetextatus, Cymolutes 368
prasiognathus, Callyodon 488, 493, 495
Pseudoscarus 488
Scarus 488
Premnas 4
biaculeatus 4
epigrammata 5, 6
leucodesmus 5
semicinctus 5
trifasciatus 4
unicolor 5
pristiger, Pomacentrus 109, 110
Pristotis 65
cyanostigma 65
fuscus 90
trifasciatus 114
violescens 71
Prochilus 6
clarkii 7
macrostoma 10
melanopus 10
percula 11
polylepis 9, 10
polymnus 7
pronus, Callyodon 410, 414
prosopeion, Halichoeres 290
Julis (Halichoeres) 290
Platyglossus 290
prosopotaenia, Dischistodus 104
Pomacentrus 104, 118
prosopotaenioides, Pomacentrus 116
prosopotoenia, Pomacentrus 117
prostigma, Julis 317
psacas, Stethojulis 242
Pseudocheilinus 341
evanidus 341, 342
hexataenia 341
hexatenia 341
octotaenia 341
psittaculus 341
Pseudocoris 302

Page
Pseudodax 210
moluccanus 210
moluccensis 210
pseudogramma, Platyglossus 285, 286
Pseudojulis girardi 188
murrayensis 256
ziczac 256
Pseudolabrus 219
rubiginosus 188
pseudominiatus, Halichoeres 271
Julis (Halichoeres) 271
Platyglossus 271
Pseudopomacentrus 65
Pseudoscarus 382
abacurus 399
aeruginosus 473, 474
altipinnis 444
augustinus 474
balinensis 457
bicolor 423, 496
brevifilis 493, 494
capistratoides 410
caudofasciatus 446
celebicus 399
chrysopoma 462
dimidiatus 425
dubius 473
dussumieri 449
erythrodon 385
fraenatus 436
frenatus 436
flavomarginatus 399
forsteri 399, 407, 410
godeffroyi 444
goldiei 386
gymnognathus 386
harid 420
(Scaris) harid 421
harid var. mastax 421
hypselopterus 484
ismailius 450
janthochir 444
jantochir 444
knerii 474
labiosus 410
lacerta 473
limbatus 488
longiceps 421
maculosus 493
margaritus 397
mastax 421
microcheilos 417
microrhinos 418
microrhinus 418
moresbyensis 457
muricatus 495
mutabilis 414
nigripinnis 421
nuchipunctatus 487
oviceps 452
papuensis 462
pectoralis 453
pentazona 414
var. schlegeli 414
platodoni 386
prasiognathus 488

Page

Pscudoscarus—Continued.
pulchellus 423, 497
var. bicolor 423
pyrrhostethus 382, 494
quoyi 407
rhoduropterus 400
rivulatus 429
rubroviolaceus 469
schlegeli 414
singaporensis 493
singapurensis 493
sordidus 398
sumbawensis 385
tricolor 460
troscheli 399
troschelii 399
var. flavoguttatus 399
variegatus 398
viridis 462, 469
vitriolinus 399
zonatus 452
psittaculus, Pseudocheilinus 341
psittacus, Scarus 381, 382
pterophthalmus, Ampheces 225
Anampses 225
pulchellus, Callyodon 423
Cheilinus 348
Pseudoscarus 423, 497
Scarus 423, 497
pulcher, Anampses 229
pulcherrima, Coris 312
Julis 312
pulcherrimus, Labrus 317
puncta, Furcaria 30
punctatus, Cheilinus 362
Julis 326
Pomacentrus 116
punctipinnis, Ayresia 30
punctolineatus, Pomacentrus 90
punctulata, Novacula 370
punctulatus, Cheilinus 362
Glyphisodon 166
purpurascens, Platyglossus 260
purpurea, Julis 326
purpures, Scarus 398
purpurescens, Halichoeres 260
Labrus 260
Platyglossus 260
purpureus, Callyodon 398
Scarus 315
pyrrhogramma, Choerojulis 287
Julis 287
Platyglossus 287
pyrrhostethus, Pseudoscarus 382, 494
pyrrhovinctum, Thalassoma 329
pyrrhurus, Callyodon 399, 405, 407
pyrrogrammus, Halichoeres 286
quadricolor, Julis (Julis) 316
quadrifasciatus, Glyphisodon 125
quadrimaculatus, Xiphocheilus 190
Xiphochilus 190
quinquecinctus, Cheilinus 350
quinquefasciatus, Scarus 245
quinque-maculatus, Hemipteronotus 370
quinquevittatus, Apogon 125
Scarus 316
Thalassoma 316

Page

quoyi, Callyodon 407
Pseudoscarus 407
Scarus 407, 462
radiatus, Cheilinus 355
Labrus 250
Sparus 355
rahti, Glyphidodon 125
Glyphisodon 125
ramosus, Cheilio 336
rarotongae, Scarichthys 378
rathbuni, Pomacentrus 71
reichei, Halichoeres 272, 273, 275
Julis (Halichoeres) 275
reidi, Pomacentrus 99
remedius, Hemicoris 307
renardi, Julis (Halichoeres) 242
Stethojulis 242
reticulatum, Tetradrachmum 18
reticulatus, Chromis 40
Dascyllus 18
Heliases 18
Hemistoma 382
Platyglosus 283
retrofasciatus, Chromis 53
rhoduropterus, Pseudoscarus 400
rhomaleus, Abudefduf 161
Rhytejulis 241
richardsoni, Abudefduf 184
Lepidaplois 207, 208
richmondi, Halichoeres 263
rivulatoides, Scarus 430
rivulatus, Callyodon 430
Cheilinus 348
Pseudoscarus 429
Scarus 429
rosea, Julis 314
rossii, Glyphisodon 167
rostratus, Callyodon 399
Cheilinus 358
rotundus, Chaetodon 125
rubellio, Ctenolabrus 216
ruber, Scarus 469
ruberrimus, Callyodon 469, 471
rubiginosa, Labrichthys 219
rubiginosus, Labrichthys 188
Pseudolabrus 188
rubrolineatus, Labrus 208
rubro-notatus, Scarus 375
rubropunctatus, Scarus 375
rubroviolaceus, Callyodon 469
Pseudoscarus 469
Scarus 469
rudis, Glyphidodon 122
ruppelii, Julis 303
Scarus 421
russelii, Scarus 430
sandvicensis, Calotomus 378
Gomphosus 334
sandwicensis, Callyodon 378, 379
Calotomus 378, 381
Leptoscarus 377, 378
sanguineus, Cheilinus 362
Verriculus 201
sapphirus, Abudefduf 175, 177
Sargus, ensifer 5

Page

saxatilis, Abudefduf 124, 125, 129, 131, 137, 138, 142
Abudefduf saxatilis 125
Chaetodon 121, 124
Glyphidodon 124, 128
Glyphisodon 124
scapularis, Choerojulis 255
Halichoeres 255
Julis 255
Labrus 247
Platyglossus 255
Scarichthys 373
auritus 373
bottae 375
caeruleopunctatus 374, 377
coeruleopunctatus 375, 378, 379, 380
rarotongae 378
vaigiensis 380
Scarus 381
aeruginosus 473, 474
auritus 373
balinensis 457
bataviensis 410, 414
bennetti 474
bicolor 496
blochii 462
bottae 375
calus 469
capistratoides 410
celebicus 399
chadri 382
chlorodon 398
chrysopomus 462
(Callyodon) coeruleopunctatus 375
coerulo-punctatus 375
croicensis 381, 382
cruentatus 385
cyanurus 421
cypho 414
dimidiatus 425
dubius 473
dussumieri 449
erythrodon 385
erythrogenys 488
fasciatus 429
festivas 398
forsteri 410
frenatus 418, 436
gallus 322
ghobban 494
gibbosus 495
gibbus 382, 435
gilberti 410
guacamaia 382
guttatus 493, 494
gymnognathus 400
harid 420
(Pseudoscarus) harid 421
hypselopterus 484
janthochir 444
jenkinsi 410
lacerta 473, 474
latus 421
limbatus 488
lividus 474
longiceps 421
lupus 542

Page

Scarus—Continued.
maculosus 493, 494
mastax 421
mentalis 398
michrocheilos 417
microgmathos 430
microrhinos 382, 418
microrhinus 435, 469
mordax 203
muricatus 495
naevius 373, 374
niger 382, 488
nigricans 398
nuchipunctatus 487
oviceps 452
paluca 469
pectoralis 453
pepo 382
prasiognathus 488
psittacus 381, 382
pulchellus 423, 497
purpures 398
purpureus 315
quinquefasciatus 245
quinquevittatus 316
quoyi 407, 462
rivulatoides 430
rivulatus 429
ruber 469
rubro-notatus 375
rubropunctatus 375
rubroviolaceus 469
ruppelii 421
russelii 430
singaporensis 493, 494
sordidus 398, 400
spinidens 380
sumbawensis 385
tricolor 460
troscheli 398
vaigiensis 376, 380
variegatus 398
vetula 381
(Calliodon) viridescens 378
viridis 462
wurk 421
xanthopleura 445
schlegeli, Pseudoscarus 414
Pseudoscarus pentazona var 414
schoenleinii, Choerodon 198
Choerops 198
Cossyphus 198
schroderi, Julis (Halichoeres) 304
schwanefeldi, Julis 320
Julis (Julis) 320
Thalassoma 320
schwanefeldii, Julis 320
schwarzi, Choerojulis 279
Halichoeres 278
Platyglossus 278
schwarzii, Julis (Halichoeres) 278
Platyglossus 278
scolopseus, Pomacentrus 118
scolopsis, Pomacentrus 118
Scorpaena oculeata 4
scotochilopterus, Chromis 38, 39, 40

Page

sebae, Amphiprion 6
sebanus, Julis 244
Semachlorella 367
semicinctus, Premnas 5
semi-decorata, Julis 294
semidiscus, Hologymnosus 313
Labrus 313
semifasciatus, Julis 317
semipartita, Coris 314
semipunctatus, Julis 250, 303
septemfasciatus, Abudefduf 125, 127, 129, 131, 135, 137
Glyphidodon 135
(Glyphidodon) 135
Glyphisodon 135
sexfasciatus, Abudefduf 129, 137
Halichoeres 245
Hemigymnus 245
Julis 250
Labrus 129
sex-maculata, Novacula 370
singaporensis, Pseudoscarus 493
Scarus 493, 494
singapurensis, Pseudoscarus 493
simsiang, Pomacentrus 90
sinsiang, Pomacentrus 90
sinuosus, Cheilinus 348
smithi, Pomacentrus 75
snyderi, Amphiprion 7
solorensis, Halichoeres 278
Julis (Halichoeres) 278
Platyglossus 278
sonnerat, Holocentrus 4
sordidus, Abudefduf 132, 133, 137
Callyodon 386, 387, 398
Chaetodon 121, 132
Glyphidodon 133
(Glyphidodon) 133
Glyphisodon 133
Pomacentrus 132
Pseudoscarus 398
Scarus 198, 400
Sparus anchorago 193
chlorurus 362
chromis 29
decussatus 253
fasciatus 125, 350
forsteri 209
hardwicke 317, 318
insidiator 212, 213
meaco 245
milii 7
nigricans 14
radiatus 355
zonephorus 245
spilogaster, Crenilabrus 216
Duymaeria 216
spilonotus, Labrus 208
spilurus, Julis 258
Julis (Halichoeres) 258
spinidens, Callyodon 380
Scarus 380
Stegastes 122
imbricatus 122

Page

Stethojulis 231, 232
albovittata 241
axillaris 234
bandanensis 235
casturi 244
filholi 237
fulvoventris 235
interrupta 240
interruptus 240
kalosoma 238
phecadopleura 237
phekadopleura 237
psacas 242
renardi 242
strigiventer 232
terina 238, 240
trilineata 243
trossula 237
zatima 238, 240
stigma, Pomacentrus 100
striatus, Epibulus 213
strigiventer, Julis 231, 232
Stethojulis 232
strophodes, Lepidaplois 207, 208
subfurcatus, Bermudichthys 315
subniger, Pomacentrus 118
suluensis, Pomacentrus 107
sumbawensis, Pseudoscarus 385
Scarus 385
Symphurus 209
taenianotus, Julis 366
taeniatus, Anampses 230
taeniometopon, Pomacentrus 90
taeniops, Pomacentrus 89, 118
taenioruptus, Glyphidodon 178
taeniourus, Labrus 365
taeniurus, Pomacentrus 72
Pomacentrus (Pomacentrus) 73
tapeinosoma, Lepidozygus 25, 26
Pomacentrus 25
taupou, Abudefduf 168, 169
Tautoga, dimidiata 247
fasciata 245
leucomos 245
melapterus 247
mertensii 245
temminckii, Julis (Halichoeres) 260
tenuispinis, Halichoeres 288
Platyglossus 288
terina, Stethojulis 238, 240
ternatensis, Chromis 31
Heliases 31
Heliastes 31
tessellata, Novacula 370
Tetradrachmum 13
arcuatum 22
aruanum 22
melanurum 20
melanurus 20
polyacanthus 27
reticulatum 18
trimaculatum 14
trimaculatus 14
tetrazona, Cheilinus 348

Page

Thalassoma 315
amblycephalus 330
aneitense 327
ballieui 331
cyanogaster 326
dorsale 317
duperrey 329
fuscus 188
guntheri 316
hardwicke 317
janseni 324
jansenii 324
lunare 321, 322
lunaris 322, 327
lutescens 326
melanochir 317, 318, 320, 328
neanis 327
pyrrhovinctum 329
quinquevittatus 316
schwanefeldi 320
umbrostigma 325
Thalliurus blochii 362
Thalluirus 343
thoracotaeniatus, Abudefduf 158
thyrsites, Julis 287
Thysanochelius 219
ornatus 219, 220
Thysanochilus 219
cyanotaenia 220
torquatus, Xyrichthys 369
Trichopus arabicus 322
tricolor, Amphiprion 9, 10
Callyodon 460
Gomphosus 331, 333
Pseudoscarus 460
Scarus 460
trifasciatus, Glyphidodon 138
Glyphidodon (Amblyglyphidodon) 138
Glyphisodon 138
Lutjanos 4
Pomacentrus 23
Premnas 4
Pristotis 114
trilineata, Stethojulis 243
trilineatus, Labrus 241, 243
Pomacentrus 89
(Pseudopomacentrus) 89
trilobatus, Cheilinus 343
Chilinus 347
trimaculata, Choerojulis 258
Guntheri 258
Julis 258
trimaculatum, Tetradrachmum 14
trimaculatus, Dascyllus 14, 18
Dischistodus 102
Halichoeres 258
Julis 366
Platyglossus 258
Pomacentrus 14, 101, 117, 118
Tetredrachmum 14
tripunctatus, Pomacentrus 89
tropicus, Pomacentrus 90
troscheli, Pseudoscarus 399
Scarus 398
troschelii, Pseudoscarus 399
trossula, Stethojulis 237

Page

trotteri, Lepidaplois 209, 210
truncatus, Julis 322, 323
tunicatus, Amphiprion 12
turchesius, Abudefduf 168, 169
typus, Xiphocheilus 190
tyrwhitti, Chaetodon 125
Glyphisodon 125
ubayensis, Platyglossus 266, 267
udanad, Cheilio 336
ultramarinus, Callyodon 418, 420
umbrilatus, Hemipteronotus 370
umbrostigma, Julis 325
Thalassoma 325
undulatus, Cheilinus 343, 352, 365
Chilinus 352
Gomphosus 332, 333
unicolor, Dascyllus 14
Premnas 5
unifasciatus, Cheilinus 357, 358
Glyphidodon 147
Pomacentrus 18
unimaculatus, Abudefduf 71, 145, 170, 171
Choerops 198, 199
Chrysiptera 145, 147
Glyphidodon 145
antjerius var 167
Glyphidodontops 145, 171
Glyphisodon 145
uniocellatus, Abudefduf 173
Glyphidodon 173
Glyphidodontops 174
Glyphisodon 173
upolensis, Callyodon 469, 471
Urichthys 343
urostigma, Julis (Julis) 317
vaigiensis, Callyodon 380
Calotomus 377
Glyphisodon 125
Leptoscarus 380
Scarichthys 380
Scarus 376, 380
vanicolensis, Pomacentrus 89, 96
variegata, Coris 304
Coris (Hemicoris) 304
variegatus, Coris 310
Halichoeres 302, 304
Hemicoris 304
Julis 304
Pseudoscarus 398
Scarus 398
varius, Gomphosus 332
venusta, Coris 307
vermiculatus, Callyodon 472
Verreo 201
Verriculus 201
sanguineus 201
verticalis, Julis 331
vetula, Scarus 381
violaceus, Glyphisodon 161
violescens, Pomacentrus 71, 81, 86
Pomacentrus (Pomacentrus) 71
Pristotis 71
viridescens, Callyodon 378
Leptoscarus 378
Scarus (Calliodon) 378
viridibusius, Callyodon 459

	Page
viridis, Cheilio	336
Gomphosus	334
Pseudoscarus	462, 469
Scarus	462
vitianus, Pomacentrus	117
vitriolinus, Pseudoscarus	399
vrolicki, Platyglossus	266
vrolickii, Halichoeres	**266**
Julis (Halichoeres)	266
Platyglossus	266
waigiensis, Glyphisodon	125
weberi, Chromis	**41**, 48
Wetmorella	**211**
philippina	**211**
wurk Scarus	421
xanthonotus, Abudefduf	**159**
Glyphidodon	159
Glyphisodon	159
Paraglyphidodon	159
xanthopleura, Scarus	445
xanthosoma, Dascyllus	18
xanthozona, Glyphidodon	178
Glyphidodon brownriggii	177
Glyphisodon	178
xanthurus, Abudefduf	42, 155
Amphiprion	7
Dascyllus	71
Diproctacanthus	233
Glyphidodon	155
Glyphisodon	155
Labroides	221, **223**
Paraglyphidodon	155
xenodon, Calotomus	376
Xiphocheilus	**190**
quadrimaculatus	**190**
typus	190
Xiphochilus	190
quadrimaculatus	190
xyrichthyoides, Novacula	369
Xyrichthys arago	366
cyanirostris	370
lecluse	368
macrolepidotus	365
microlepidotus	368
novaculoides	369
torquatus	369
zamboangae, Choerodon	**196**
Choerops	196
zatima, Stethojulis	238, 240
zeylanicus, Labrus	322
ziczac, Pseudojulis	256
zonatus, Abudefduf	170, 171, **179**
Abudefduf brownriggii var	179
Glyphidodon	179
Glyphidodontops	179
Glyphisodon	179
Pseudoscarus	452
zonephorus, Sparus	245
zonularis, Callyodon	446, 449
zonurus, Cheilinus	357

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
U.S.GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
$1.00 PER COPY

▽